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DISEASES CAUSED BY BACTERIA AND FUNGI.

I. Brown, J. H. (1937). **Significance of the Haemolytic *Streptococci* found in Milk.**—*Cornell Vet.* **27.** 110-121. 5 figs., 5 tables. [14 refs.]

II. Davies, D. J. (1937). **Bovine Mastitis in Relation to Milk-Borne Epidemics.** —*J. infect. Dis.* **60.** 374-380. 3 figs. [7 refs.]

I. The discussion is concerned with the beta-haemolytic streptococci only. Two tables indicate the serological groups of over 1,000 strains, their cultural characters and pathogenicity for mice. Fermentation tests with sorbitol and trehalose served as a rough guide to division into Lancefield's serological groups, and only 8 out of 1,064 strains yielded divergent results.

Group B strains some of which are a common cause of bovine mastitis are separated from other sorbitol-negative streptococci by their action on sodium hippurate. Strains from this group which ferment lactose are of animal origin. All those from human sources ferment salicin. About 40% of animal strains fail to ferment salicin and two-thirds of the human strains fail to ferment lactose. The source of over half the strains could be definitely classified by these reactions.

II. Sources of infection of the important diseases capable of transmission to man from infected udders, are indicated.

D. succeeded in causing mastitis by smearing streptococci from cases of human septic sore throat on to scarified teats, and other workers have done the same with unscarified teats. The importance of the teat duct is considered, the histology being described. Negative results were obtained in experiments to ascertain if a dye-stained liquid could be sucked up into the milk sinus by the movements produced within teats by the action of milking.

Observations were made on the pathology of two infected udders, one responsible for an outbreak of sore throat and the other experimentally infected with mastitis.

The importance of staphylococci is also discussed. A few experiments indicated that they do not ascend the teat duct as readily as streptococci. When inserted into the duct they did, however, cause mastitis.—F. H. Manley.

DECHIGI. (1935). Come si differenziano gli streptococchi beta-emolitici de latte normale e patologico. Primo reperto in Italia di una mastite bovina ad etiologia umana. [**The Differentiation of Haemolytic Streptococci Isolated from Milk**].—*Boll. Ist. sieroter. Milano.* **14.** 313-342. 1 table. [Numerous refs.] [English, French and German summaries].

D. gives the results of examination of many strains of streptococci isolated from bulk milk or from udders with mastitis. The strains are compared in a table showing the type of haemolysis, reduction of methylene blue and of Janus green, and behaviour in sodium hippurate and in six sugars. Amongst the strains was one which was isolated from an udder with mastitis : it was beta-haemolytic, did not reduce the two dyes, did not split sodium hippurate, and fermented salicin and trehalose, but not mannite or sorbitol. It was therefore regarded as a strain of human origin.—J. E.

I. WALTHER, R. (1936). Versuche zur Frage der Züchtung des Streptococcus agalactiae (Kitt 1893 Klimmer und Haupt 1930) bei Gegenwart zahlreicher Begleitbakterien. [**Culture of *Str. agalactiae* in Presence of Other Bacteria.**—*Inaug. Diss., Leipzig.* pp. 54. 16 tables. [Numerous refs.]

II. KÄSTLI, P. (1937). Resultate und Erfahrungen im ersten Jahr Galtbekämpfungsverfahren. [**Results of One Year of Mastitis Control**].—*Schweiz. Arch. Tierheilk.* **79.** 168-172.

III. STANG, LERCHE, & NIEDER. (1937). Begünstigt die Verabreichung hoher Kraftfuttergaben bei Milchtieren die Entstehung des gelben Galtes. [**Effect of Food Concentrates on the Incidence of Mastitis**].—*Dtsch. tierärztl. Wschr.* **45.** 337-346.

I. W. tested the effect of various physical and chemical agencies on *Str. agalactiae* and the bacteria commonly found as contaminants in milk samples. He finds that *Str. agalactiae* is more susceptible to heat than the contaminants and cannot, therefore, be selectively cultivated by raising the incubation temperature or by heating the milk beforehand. *Str. agalactiae* and the common contaminants cannot be even partially separated by fractional centrifugation, both being present in greater numbers in deposit than in cream and in smaller numbers in supernatant or skim milk.

Various chemical substances were tested. Entozon, trypaflavine and " ventrase " all hindered the growth of *Str. agalactiae* more than that of the contaminants. Of the remainder, malachite green, sodium sulphide, sodium chlorate, fuchsin, methyl violet, victoria-blue 4R, potassium ferrocyanate, sodium chloride, chloral hydrate, pyronin, and sodium sulphocyanate did not show any selective action favourable to *Str. agalactiae.*

In a few experiments carried out in whey which had been brought to pH 4·5, it was found that 1% or 2% boric acid hindered the growth of the contaminants more than that of *Str. agalactiae.*

II. In August, 1935, a voluntary scheme for the control of bovine mastitis (and abortion) came into operation in Switzerland. By December, 1936, it had been taken up in the Berne canton by the owners of 106 herds comprising 1,172 cows, of which 389 (33%) were found to be infected. At the time of report (April, 1937) 67 herds were free. Some animals were slaughtered because they were regarded as not worth treatment or because treatment failed, but these only formed 17·2%. The remainder were treated by udder infusion, usually by Steck's method. Certain difficulties which were met with are detailed, the chief of these being :– the unwillingness of certain owners to allow treatment of cows which only showed latent infections ; the drying up of quarters because owners and milkers did not

realize that the clinical symptoms immediately following treatment could be cleared up by adequate stripping ; owners' failure to understand that latent cases are contagious ; the use of unsatisfactory methods of treatment by veterinary attendants ; difficulties in the transit of milk samples during the summer and, therefore, lack of satisfactory diagnosis, and finally lack of control samples after treatment.

Details are given of the cost, and K. suggests that the question arises whether some sort of compulsion may not be necessary. He is emphatic that mastitis can only be controlled by a systematic eradication of the causal organism.

III. The authors compared the incidence of new infections in three groups, each of five or six healthy cows maintained in a heavily infected herd, but given different rations, over a period of four months. The methods of diagnosis included cell counts, pH, chloride estimations and microscopic and cultural examinations. Group I was given a ration with a very high protein content, group II a ration with a moderate protein content and group III (the control group) a normal ration. Three out of six cows in group I showed clinical mastitis and one latent infection. Four out of five cows in group II showed clinical mastitis and there was a latent infection in the fifth. One out of six in the control group showed clinical mastitis and there was one latent infection. The figures, though small, are regarded as suggesting that high protein feeding has an unfavourable effect. The authors remark, however, that in the rest of the herd at grass many new infections occurred and that no watch was kept on the hygienic precautions taken by the milkers to avoid the spread of infection. Increased cell content followed mastitis infection and had no independent connexion with feeding. The pH, chloride and clotting tests (rennet) are looked on as helpful methods of diagnosis, but cultural and microscopic examinations are regarded as essential. The feeding had no effect on the normal flora of the various quarters.—A. W. Stableforth.

I. Hotis, R. P., & Miller, W. T. (1936). **A Simple Method for Detecting Mastitis Streptococci in Milk.**—*Circ. U.S. Dep. Agric.* No. 400. pp. 6. 1 plate, 1 table. [9 refs.]

II. Bryan, C. S., & Nelson, E. A. (1937). **Influence of Contaminating Bacteria on the Results of the Microscopic Test for Streptococcic Mastitis.** —*Amer. J. publ. Hlth.* **27.** 914-917. 2 tables. [2 refs.]

III. Bryan, C. S. (1937). **The Incidence of Streptococcic Mastitis among Dairy Cattle.**—*Vet. Med.* **32.** 70-74. 1 fig., 4 tables. [12 refs.] [French and German summaries].

I. The test described, which is called the Hotis test, consists in adding 0·5 c.c. of sterile 0·5% aqueous solution of brom-cresol-purple to 9·5 c.c. of milk carefully collected directly from the animal. After mixing, the sample is incubated at 37°C. and the results are observed 24 hours later. The presence of a growth of *Streptococcus agalactiae* is indicated by a characteristic change in the colour of the sample after incubation, together with the occurrence of flakes or balls of growth which frequently adhere to the sides of the tube. It is stated that when *Str. agalactiae* is present it is rare that no clumps or flakes are noted. The flakes vary from the size of a pin-point when numerous to about 4 mm. when only a few are present.

The examination of 753 samples of milk by the above test and by the blood agar method showed the two tests to be in agreement in 668 positive samples and 47 negative samples respectively, *i.e.*, 95% of all samples tested. In order to obtain clear-cut results with the tests, it is essential that the milk should be collected directly from the animal and with all aseptic precautions.

II. It is shown that the presence of the common contaminating bacteria (*Bact. coli*, *Bacillus subtilis* and *Staphylococcus aureus*) leads to a decrease in the relative or absolute numbers of streptococci and to the accuracy of the microscopic test for the detection of mastitis streptococci, their effect being in the order given. The presence of 1 : 50,000 brilliant green (0·1 c.c. of 1 : 500 aqueous solution in each 10 c.c. sample tube) greatly inhibits this effect. Bacteria, other than streptococci which may be present in the udder itself, *e.g.*, *Brucella abortus*, and udder micrococci, do not greatly interfere with the reproduction of the streptococci, but their effect is altogether removed by the presence of 1 : 50,000 brilliant green. The addition of the dye does not remove the necessity for taking ordinary precautions in sampling.

III. B. made a survey to determine the incidence of streptococcal mastitis in a typical milking area containing about 1,000 producers. 322 unselected herds containing 2,715 cows, were tested. The test used for diagnosis was the microscopic examination of mixed samples (from the four quarters) after incubation for at least 12 hours. The presence of streptococci, together with leucocytes in excess of 1,000,000 per c.c., was taken as indicative of streptococcal mastitis.

Infection was found in 86% of the herds and in 22·2% of all cows tested. The incidence and infection were not influenced by the size of the herd, some large and some small herds being found to have a high percentage of infected cows and others a low incidence.

Most cows that are unprofitable because of mastitis are apparently eliminated from the herds prior to reaching the age of six or seven years, but the majority of those which remain are affected with streptococcal mastitis.—A. W. Stableforth.

I. Bryan, C. S., & Taylor, G. E. (1938). **The Relation of Certain Physical Factors to Infection with Streptococcic Mastitis.**—*N. Amer. Vet.* **19.** No. 1. 26-30. 4 tables. [4 refs.]

II. Bryan, C. S. (1938). **A Study of Experimental Streptococcic Mastitis in Dairy Cattle.**—*Vet. Med.* **33.** 72-74. 2 photographs. [6 refs.]

I. A study of 121 cows showed that it was equally common for fore and hind quarters of the udder to become affected with streptococcal mastitis. The influence of pressure on either side of the udder caused by the animal lying down was found to be negative.

Microscopic examination of milk samples after incubation for 24 hours is stated to be the most reliable method of diagnosis, followed, in order of decreasing efficiency, by manual examination of the udder, examination of milk for abnormally high leucocyte content (over one million leucocytes per ml. considered diagnostic), test for chloride-content of milk, thybromol test and lastly, physical examination of milk. It was found that 76·1% of the cows became infected during the first three months of their lactation. The authors state that they have abandoned the use of cultural tests, but do not give the reasons.

II. The economic losses from mastitis, including the resultant reduction in yield, quality and palatability of milk are discussed. The danger to human consumers from milk infected with streptococci of human strains is emphasized. It was found that 86% of the herds and 26·2% of the cows studied were affected with streptococcal mastitis. The organism is considered to gain entry *via* injuries to the udder and teats. Feeding of cultures of *Str. agalactiae* and intravenous or subcutaneous injection of cultures failed to produce infection of the udder. The symptoms produced by infection set up by dipping injured teats in cultures of the organism are described.—H. Burrow.

COWAN, S. T. (1938). **The Classification of Staphylococci by Precipitation and Biological Reactions.**—*J. Path. Bact.* **46.** 31-45. 8 tables. [18 refs.]

JULIANELLE and WIEGHARD [*V. B.* **5.** 778.] divided the strains of staphylococci into two groups, the pathogenic and saprophytic, on the basis of precipitation reactions. In this investigation, C. attempted to confirm this work with 146 strains of human, animal and miscellaneous origin, but came to the conclusion that the classification requires modification. Regarding the classification of staphylococci on their metabolic activities, C. has adopted one based on that of ANDREWES and GORDON (1907), but modified in order to include haemolysin production, a point which he considers to be of major importance. The details of this paper do not lend themselves to abstraction and should be consulted in the original.

—GWILYM O. DAVIES.

PERKINS, L. E. (1937). **A Few Notes on Anthrax from the Administrative Standpoint.**—*Vet. Rec.* **49.** 1337-1344.

The symptoms of anthrax, the equipment necessary to enquire into a suspected case in the field, the microscopic examination of smears, the technique of the laboratory investigation on suspected material, the disposal of carcasses and the cleansing and disinfection of infected premises are among the questions considered. Possible origins of infection are discussed, and P. expressed the opinion that in Great Britain, although official statistics indicate that contaminated food-stuffs and artificial manures are chiefly suspected, latent soil infection is by no means an uncommon source of disease. The questions of vaccination and serum inoculation are dealt with briefly.—J. C. WALLACE.

MÉLANIDI, C., & TZORTZAKI, N. (1937). L'influence de l'aération sur la virulence des vaccins anticharbonneux. [**The Effect of Aeration on the Virulence of Anthrax Vaccines**].—*Bull. Acad. vét. Fr.* **10.** 368-373.

A laboratory study of the behaviour of anthrax vaccines kept in sealed containers from which air is excluded and in plugged tubes to which air has access. It was found that, while a rapid lowering of virulence occurred *in vacuo*, virulence persisted under aerobic conditions.—H. BURROW.

HUPBAUER, A. (1937). Prilog poznavanju glukozidskih vakcina. [**Glucoside Vaccine against Anthrax**].—*Jugoslov. vet. Glasn.* **17.** 341-354. 5 tables. [German summary].

A comparison of the effect on rabbits of four anthrax vaccines, two being spore vaccines and two, glucoside vaccines. Immunity conferred was somewhat stronger in the case of the latter, though all were of value.—B. OSWALD (KRIŽEVCI).

I. SCHAEFFER, W., & SANDOR, G. (1937). Etude sérologique des antigènes capsulaires et somatiques de la bactéridie charbonneuse par les réactions de floculation et de fixation du complément. [**Serological Studies of the Capsular and Somatic Antigens of** *Bacillus anthracis*].—*C. R. Soc. Biol. Paris.* **126.** 187-189. [1 ref.]

II. SCHAEFER, W. (1937). Les phénomènes de déplacement de l'anneau et de l'anneau double dans la réaction d'Ascoli. [**The Displaced Ring and the Double Ring Phenomenon in Ascoli's Precipitation Test for Anthrax**].—*Ibid.* 480-482. [3 refs.]

I. It has already been shown that all strains of anthrax bacilli, whether virulent or attenuated, possess both a capsular and a somatic antigen, which can be prepared in a pure state. The capsular substance is very much more active than

the somatic: mixed with anticapsular serum it flocculates at dilutions up to one in ten million, whereas the latter, mixed with its corresponding serum, flocculates only at dilutions up to one in one hundred thousand. Excess of antibody or antigen will inhibit the flocculation of capsular antigen, and although this has not as yet been demonstrated in the case of the somatic antigen, it may have been due to the lower value of the serum used. The specificity of the antigens can also be shown by the complement-fixation test.

II. The position of the ring in Ascoli's test depends on the concentrations of antigen and antibody. If the antigen is in excess, the ring forms in the serum, and when the serum is in excess of the antigen, it forms in the latter. The same phenomenon occurs with other organisms, especially *Corynebacterium diphtheriae.* The appearance of a double ring is due to the presence of two antigens, capsular and somatic, in different concentrations.—A. WILSON TAYLOR.

—. (1937). **Report of the Special Committee on Tuberculosis [Amer. Vet. Med. Ass.]**—*J. Amer. vet. med. Ass.* **91.** 433-434.

Progress continues in the eradication of TB. in cattle in U.S.A. In 1936-1937 more than 13 million cattle were tested, of which 90 thousand (0·7%) reacted and were removed from the herds. Avian TB. in the middle and north central sections of the country is not being eliminated as rapidly as was hoped, but there is some reduction in the percentage of infected swine carcasses. The importance of proper application and interpretation of the tuberculin test is emphasized.—A. W. TAYLOR.

I. WEISSTANNER, M. (1937). Untersuchungen über die Zuverlässigkeit verschiedener Tuberkulinisierungsmethoden beim Rind. [**Reliability of Various Tuberculin Test Methods on Cattle**].—*Inaug. Diss., Bern.* pp. 52. 18 tables. [Numerous refs.]

II. HEMMERT-HALSWICK. (1937). Gibt es in Deutschland eine Vorschrift zur Verhütung der Tuberkulose bei den Jungtieren? [**The Question of State Prevention of Tuberculosis in Young Animals in Germany**].—*Reichsgesundheitsblatt.* **12.** 543.

I. 537 animals were tested with various tuberculins by subcutaneous, intradermal and conjunctival methods. The subcutaneous was not reliable [W. does not provide satisfactory evidence for this statement] as 68 out of 143 non-reactors showed TB. lesions P.M. 1·5°-2°C. rise in temperature was taken as a positive reaction. Testing immediately after a fatiguing journey increased the margin of error. Positive reactors may give negative reactions to retesting up to one month after the first test. Some reactors showed a transitory rise of temperature lasting only a few hours.

The conjunctival test was slightly better, but the double intradermal was the most reliable. 64 animals tested by the latter method showed 43 reactors, one of which showed no lesions P.M. 21 non-reactors were negative P.M.

II. Calves should be completely segregated from the parent animals when two days old, in a stall not previously used by adult bovines, or in one disinfected under veterinary supervision. They should if possible be fed on pasteurized milk or on milk of tubercle-free cows. After weaning they are to be tuberculin tested, reactors removed, and non-reactors used as the basis of a new herd and kept separate from the old herd.—D. SLAVIN.

I. MONTRONI, L. (1937). Contributo anatomo patologico allo studio della tuberculosi aperta del fegato dei bovini. [**Open Tuberculosis of the Liver in Cattle**].—*Nuova Vet.* **15.** 355-363. 15 figs.

II. Bertolini, G. (1937). Sulla tubercolosi dei vitelli di origine ombelicale. [**TB. of Umbilical Origin in the Calf**].—*Azione vet.* **6.** 838-840. 2 figs.

III. Giacomini, A. (1937). Infezione tubercolare primaria della vagina. [**Primary TB. of the Vagina of a Cow**].—*Clin. vet., Milano.* **60.** 232-235.

IV. Nuzzi, A. F. (1937). Profilassi della tubercolosi bovina. [**Regulations Concerning the Control of Bovine TB. in Italy**].—*Profilassi.* **10.** 110-113. [7 refs.]

I. M. describes in detail the appearance of the diseased liver, illustrating it with photographs, and stressing the role of the bile ducts in the progress of the disease.

II. Infection in calves may be *via* the lungs, from food, and from congenital infection through the mother. He describes three cases of infection of the umbilical cord.

III. A description of TB. of the vagina of a cow, contracted from an infected bull.

IV. A general discussion on the position in Italy, with particular reference to diagnosis by Finzi's exotuberculin, which is said to be very reliable. N. advocates a slaughter policy for tuberculous cattle.—S. F. J. Hodgman.

I. Kiedrowski, L. (1936). Zur Darmtuberkulose des Rindes, unter Berücksichtigung des zyklischen Verlaufes der Tuberkulose. [**Pathogenesis of Intestinal Tuberculosis in Cattle**].—*Z. InfektKr. Haustiere.* **50.** 41-64.

II. Hildenbrand, E. G. (1936). Beitrag zur Enstehung der Tuberkulose des Kalbes bis zum Alter von 4 Wochen nach Untersuchungen am Städtischen Schlachthof Giessen. [**Tuberculosis in Calves up to Four Weeks Old**].—*Inaug. Diss., Giessen.* pp. 44. 1 table. [Numerous refs.]

III. Sassenhoff, I. (1936). Pathologische Anatomie, Histopathologie und Pathogenese der Pelztiertuberkulose. [**Pathology and Pathogenesis of Tuberculosis in Fur Animals**].—*Inaug. Diss., Munich.* pp. 23. 9 figs. on 7 plates. [15 refs.]

I. In calves, primary intestinal tuberculosis is more common than is generally recognized. K. describes six cases of complete primary complex in the ileum and related lymph nodes, and four cases in which the mesenteric glands alone were involved. In the latter, it was considered that the intestinal lesions had completely healed. The calves were between six and 12 weeks old.

Among seven young cattle, one to two years old, three complete primary complexes were found in the intestine, the remaining four being limited to the lymph nodes. The proportion of incomplete lesions was thus greater than in calves.

In 62 adult cattle with intestinal tuberculosis, chronic pulmonary tuberculosis was frequently found to be accompanied by intestinal ulceration (16 out of 24 cases). In 39 cases of generalized tuberculosis, intestinal ulceration was found in only 12 animals. In the latter case the mesenteric lymph nodes may show no macroscopic changes, hence the importance even when there are no lymph node lesions, of a thorough examination of the intestines in the course of meat inspection.

II. This paper includes a useful summary of previous work on the pathogenesis of tuberculosis in young calves. H. examined 12 tuberculous calves of ages varying from 14 to 27 days, and one eight months foetus, and the cows which had produced the calves were examined clinically and their breeding history obtained.

Microscopic examination of the uterine exudate showed the presence of acid-fast bacilli in 11 cows. In two of them acid-fast organisms were found also in the bronchial mucus; it was considered unnecessary to carry out g. pig inoculation

in connexion with these animals. The remaining ten samples of uterine contents were positive to the biological test.

The foetus showed primary tuberculosis of the liver and portal lymph nodes, and the dam was affected with pulmonary, uterine and udder tuberculosis.

From his own observations and the work of others, H. considers that, whereas calcification can be detected under the microscope in tuberculous lesions in calves as early as three weeks after infection (occasionally even earlier), macroscopic evidence of this change (" Verkreidung ") requires at least 50 days for development. Calcification was seen macroscopically in the lymph nodes in all the calves.

It is suggested that the compulsory notification of all cases of tuberculosis encountered in young calves at slaughter is advisable.

[The question of the pathogenesis of tuberculosis in calves is still undecided. The presence of primary lesions in the liver and portal lymph nodes may be due to infection by way of the umbilical vein before birth, or it may be alimentary in origin. Whereas some workers consider that the presence of a primary complex in the liver always indicates uterine tuberculosis in the cow, others are unwilling to accept this view, and are convinced that some cases at least are due to post-natal alimentary infection. The results reported in this paper support the former view.

Compulsory notification of tuberculosis in calves at slaughter was introduced in Saxony in 1919. The cow is traced and examined for the presence of tuberculosis. Owing to the success of this procedure, similar regulations have been made in Mecklenburg-Schwerin, Württemberg and Brunswick].

III. S. examined 10 foxes and 7 mink affected with tuberculosis. The results obtained were in the main similar to those already recorded by NIEBERLE and his co-workers during the last few years.

The lesions closely resembled those seen in the dog. The tissue reaction to the tubercle bacillus was productive in character with the formation of epithelioid cell tubercles. In the centre of these tubercles caseation did sometimes occur due to excessive phagocytosis, but, except in the lymph nodes, this was not visible to the unaided eye. Tuberculous periarteritis and periphlebitis, with extension to the intima, were common findings.

In the fox, the primary complex is usually found in the intestine, which is ulcerated ; in the mink, it is commonly in the lung. Early generalization takes place by the lymph and blood stream in both species.—E. G. WHITE.

I. COULAUD, E., & TROCMÉ, S. (1937). Essais de vaccination complète du cobaye vis-à-vis de la tuberculose. [**Vaccination of the Guinea Pig against Tuberculosis**].—*Bull. Acad. Méd. Paris.* **117.** 368-370.

II. TAKAHASHI, Y. (1937). Sur l'infection per os du cobaye par le bacille tuberculeux aviaire. [**Infection of Guinea Pigs with Avian Tubercle Bacilli** *per os*].—*C. R. Soc. Biol. Paris.* **126.** 561-562.

III. NÈGRE, L., BERTHELOT, A., & BRETEY, J. (1937). Sur l'action retardante exercée par les esters éthliques de certains acides gras saturés sur l'évolution de la tuberculose expérimentale du cobaye. [**The Inhibitory Action of the Ethyl Esters of Certain Saturated Fatty Acids on Experimental TB. in Guinea Pigs**].—*Ann. Inst. Pasteur.* **59.** 457-466. [8 refs.]

IV. BUONOMINI, G. (1937). Le pouvoir vaccinal des formes lisses du bacille tuberculeux. [**Antigenic Value of Smooth Strains of Tubercle Bacilli**]. —*Boll. Sez. ital. Soc. int. Microbiol.* **9.** 285-293. 1 table. [In French].

V. NINNI, C. (1937). Variations de la résistance locale et générale vis-à-vis de la tuberculose chez les cobayes préalablement traités par des actinomycètes, des mycotorulées et des poudres de lycopode en comparaison de

la résistance conférée par les B. de Koch tués et par le B.C.G. [**Resistance to TB. of Guinea Pigs Injected with Actinomycetes, Mycotorulae and Lycopodium Compared with that Caused by Dead Tubercle Bacilli and BCG**].—*Ibid.* 354-361. [12 refs.] [In French].

I. Twenty g. pigs were inoculated with killed tubercle bacilli suspended in paraffin of M.P. 46°C., the inoculum forming a hard, palpable mass. One month later virulent bacilli were given (intraperit.), and with the exception of one that died after three months, none of the protected animals showed any sign of TB. on autopsy.

II. A large dose of avirulent avian tubercle bacilli, administered *per os* to g. pigs, is almost entirely eliminated by the following day. A few organisms apparently penetrate the digestive tract and cause a feeble sensitivity to tuberculin, and while no organisms can be obtained in culture from the organs within ten days of feeding, or two months afterwards, positive results may be obtained between the tenth and twentieth days.

III. Ethyl esters of a relatively high molecular weight, notably the palmitate, given (subcut.) to tuberculous g. pigs in doses of from 0·2 to 0·5 c.c., had an inhibitory effect on the disease. Preventive inoculation with these products, *i.e.*, before infection, had no appreciable effect. It apparently causes an enlargement of the spleen and a general stimulation of the reticulo-endothelial system, to which their effect is attributed.

IV. G. pigs were inoculated with a smooth avirulent culture of tubercle bacilli, incapable of producing an allergic reaction, and were subsequently shown to have no resistance to a more virulent strain. B. inclines to the view that allergy is a necessary accompaniment of immunity.

V. BCG and heat-killed tubercle bacilli conferred a better immunity than the other antigens used, all of which were capable of producing granular lesions in g. pigs. The inoculation of actinomycetes prolonged the life of the test animals as compared with controls, without preventing abscess formation at the site of inoculation. The method of preventive inoculation would appear to have some effect on the resistance produced, as g. pigs given intraperitoneal injections of lycopodium were more resistant than those inoculated in the cervical lymph nodes.

—A. Wilson Taylor.

Albrecht, A. (1937). Zum Vorkommen der Tuberkelbazillentypen Typus gallinaceus und humanus bei Wiederkäuern einschl. Wild ; Typus bovinus bei Schafen. [**Types of Tubercle Bacilli in Ovine Tuberculosis**].—*Tierärztl. Mitt.* **18.** 624-626. [2 refs.]

Albrecht, A. (1937). Zum Vorkommen der Tuberkelbazillentypen (T. humanus, bovinus, gallinaceus) beim Schwein. [**Types of Tubercle Bacilli in Porcine TB**].—*Ibid.* 640-642. [Numerous refs.]

Albrecht, A. (1937). Ueber Geflügeltuberkulose und ihre Beziehung zu den beiden Säugetiertypen des Tuberkazillus (T. humanus und bovinus). [**Connexion between TB. of Fowls and the Two Mammalian Types of Tubercle Bacilli**].—*Ibid.* 871-873. [15 refs.]

These are useful, but not exhaustive, reviews.—J. E.

Topolnik, E. (1937). Prilog poznavanju tuberkuloze peradi kod nas. [**Avian Tuberculosis in Yugoslavia**].—*Jugoslov. vet. Glasn.* **17.** 308-315. 4 tables. [Numerous refs.] [German summary].

A record of comparative intradermal tests on 4,850 fowls with tuberculin prepared by two different institutes. Both samples of tuberculin yielded the same percentage (0·82) of positive reactions.—B. Oswald (Križevci).

I. Schoening, H. W., Gochunoer, W. S., & Grey, C. G. (1938). **Studies on Erysipelothrix rhusiopathiae with Special Reference to Smooth and Rough Type Cultures.**—*J. Amer. vet. med. Ass.* **92.** 61-67. 2 figs., 2 tables. [1 ref.]

II. Breed, F. (1938). **Swine Erysipelas. Its Distribution, Increasing Importance and Control.**—*Ibid.* 344-355. 1 table.

I. Rough and smooth types of *E.r.* are described and illustrated. Smooth strains change to rough in old cultures, the change being influenced by the pH reaction, the composition of the media and frequency of subcultivation. A detailed description is given of a method of preparing antigen for use with the agglutination test. Rough cultures, while proving avirulent to mice, immunized them against subsequent inoculation with smooth cultures. Both types of organism were isolated from a single case of the disease.

II. The spread of S.E. through the United States since 1930 is traced. The control of the disease is especially difficult since the organism remains viable after exposure to direct sunlight for 12 days, in pickled meat for 170 days, in smoked ham for 3 months and in putrefied meat for 4 months. B. urges the control of chronic carrier swine transported from market to market and suggests that :– (1) the disease should be scheduled as notifiable ; (2) pigs sold in markets should be marked, and (3) pigs should be excluded from sales unless they have passed an agglutination test (rapid test). The serum-simultaneous method of vaccination is recommended.—H. Burrow.

van Roekel, H., Bullis, K. L., & Clarke, M. K. (1938). **Erysipelas Outbreaks in Turkey Flocks.**—*J. Amer. vet. med. Ass.* **92.** 403-418. 5 figs., 3 tables. [3 refs.]

Three outbreaks of infection due to *Erysipelothrix rhusiopathiae* in turkeys are described. There were diffuse haemorrhages in the muscles and fascia, especially in the breast and inner part of thighs, and also petechiae. The trachea, pericardium, pleura, peritoneum, lungs, spleen and small intestines also sometimes showed petechial haemorrhages. The organism was cultivated from the heart, liver, spleen, pericardial fluid and nasal mucosa.

In one outbreak 10 c.c. of swine erysipelas antiserum was given intraperitoneally apparently with beneficial results. The organisms from these outbreaks were compared culturally and by animal inoculation with those from other sources, and proved to be *Erysipelothrix rhusiopathiae*. This organism not only causes mortality and heavy loss of condition in turkeys, but experimentally proved fatal to five of 17 chickens inoculated with it.—H. S. Purchase.

Rodriguez-Rosas, V. (1938). **Observations upon the Occurrence of Pasteurella in a Herd of Calves after an Outbreak of Hemorrhagic Septicemia.**—*Thesis, Cornell.* pp. 23. 4 tables. [9 refs.] [Thesis not published. Abst. prepared from author's MS.]

A study of the incidence of pasteurella in a herd of calves recently affected with H.S. The author found that the organism which caused the outbreak had apparently not become well established in the herd. Organisms of the pasteurella group were isolated in the course of periodic examinations of nasal swabs made from all animals. Approximately one half of the examinations revealed members of the group. Since it was shown in a preliminary study that the method used would not reveal more than one half of the carriers, it is concluded that practically all the calves carried members of the pasteurella group during the entire period of observation. The organisms isolated did not belong to a single type of pasteurella. Because of the diversity of the types isolated, and because no antibodies specific

for the organisms carried were found, the greater part, or all, of the organisms isolated were considered to be saprophytic. There was no evidence they had any disease-producing power.—Herbert L. Gilman.

Maida, C. (1935). Sul valore del metodo di Weichlein per la vaccinazione contro il colera aviario. [**The Value of Weichlein's Method in Vaccination against Fowl Cholera**].—*Nuova Vet.* **13.** 153-161. 1 table.

Pure methylene blue, 5 g. per 100 c.c. of *Pasteurella aviseptica* culture, is used to kill the organisms. M. considered, after one small experiment, that the method has little value.

Vrla, J. (1937). Tularemia humana. [**Tularaemia in Czechoslovakia**].—*Zvěrolék. Obz.* **30.** 282-289.

An account of 30 cases of tularaemia that occurred in 1936 and 1937.

—E. Přibyl (Brno).

Lee, A. M., & Scrivner, L. H. (1938). **An Investigation of Severe Losses from Abortion in Ewes.**—*J. Amer. vet. med. Ass.* **92.** 68-72. 1 fig. [7 refs.]

A bacillus was isolated from the blood of ewes in a flock in which 50% aborted. When injected in pure culture into pregnant ewes, this bacillus caused abortion. Cultural and morphological studies showed that it was distinct from any known species of bacterium, being most closely related to *Bact. coli.*—P. S. Watts.

Goetchius, G. R. (1936). **The Colon-Typhoid Intermediates as Encountered in the Intestinal Tract of Gallus Domesticus.**—*Thesis, Cornell.* pp. 52. 6 tables. [Numerous refs.] [Thesis not published. Abst. prepared from author's MS.]

Members of the colon-typhoid intermediate group were isolated from the intestinal tract of 23 out of 50 chickens previously affected with fowl paralysis, but from only 16 out of 193 unaffected chickens examined. The organisms were obtained from birds which came from many widely scattered flocks. Thirty-eight cultures were maintained.

Thirty of the cultures actually revolved closely around a single type, while the other eight represent an odd lot of varying cultural types. Both groups represented a type which had the appearance of paratyphoid bacilli on lactose agar, yet which differed markedly from the salmonella group in cultural and serological characteristics. The most desirable place for these organisms in the present scheme of classification is in the paracolon group. These paracolon types did not produce any disease symptoms on oral administration to chickens, but they did establish themselves in the blood stream for over a month when injected intravenously.

—Herbert L. Gilman.

I. Madsen, D. E., & Larsen, O. G. (1936). **Transmissibility of Bang's Disease among Dairy Cattle in a Utah Dairy Village.**—*Bull. Utah agric. Exp. Sta.* No. 272. pp. 12. 4 figs., 2 tables.

II. —. (1937). **Report of the Special Committee on Bang's Disease [Amer. Vet. Med. Ass.]**—*J. Amer. vet. med. Ass.* **91.** 459-462.

III. Elder, C. (1937). **Control of Bang's Disease in Missouri.**—*Bull. Mo. agric. Exp. Sta.* No. 388. pp. 14. 2 figs., 2 tables.

IV. Cunningham, W. S., & Davis, R. N. (1937). **Control of Bang's Disease by Tests and Segregation.**—*Bull. Ariz. agric. Exp. Sta.* No. 157. pp. 131-139. 1 table. [12 refs.]

I. A description of the spread of bovine brucellosis in a small area where

contact between the herds was necessarily close, and in which the abortion rate was high.

II. The federal brucella infection eradication programme continues to make progress. The tube agglutination test has been standardized for a number of years and, if only for this reason, is more satisfactory than the plate method. The test should not be regarded as the sole evidence in determining infection, and as there is no fixed " positive " titre, the opinion of the man who knows the cattle concerned should also be taken into account, especially in the case of suspicious animals. Vaccination is still in the experimental stage. Calfhood vaccination appears more promising than any other immunization method, but further research is required. Vaccination with living cultures, even with those of low virulence, must still be associated with a certain element of danger.

III. A popular bulletin dealing with progress in eradication under the federal programme in Missouri. From 1934 to 1937 the percentage of infected cattle in the state was 7·3 ; this has now been considerably reduced. The tube aggl. test is used, complete agglutination at 1 : 100 being taken to denote a reactor. The difficulty experienced in cleaning up some herds is discussed, important factors being :– (1) addition of infected cattle to the herd, (2) virulence of the initial infection, and (3) the presence of suspects in the herd.

IV. Five herds were selected for a control experiment, the percentage of infected animals varying from 23-81. Reactors were separated from non-reactors, but kept on the same farm and looked after by the same attendants. In two herds no new reactors appeared, in two more the disease was eradicated in two years, and the fifth herd was not cleaned up in that time. The authors conclude that eradication by testing and segregation is feasible under Arizona conditions.

—A. Wilson Taylor.

I. Anon. (1937). Foreløbig meddelelse fra Veterinaerdirektøren om resultatet av bekjampelsen av smittsom kastning pr. 30.-6.-37. [**Report by the Veterinary Directorate on Control of Bovine Brucellosis, June, 1937**].—*Norsk VetTidsskr.* **49.** 471-475. 2 tables, 2 graphs.

II. Holth, H. (1937). Oversikt over de diagnostiske undersøkelser i anledning den smittsomme kastning foretatt ved Veterinaerinstitutet i 1936. [**Results of Diagnostic Work on Bovine Brucellosis by the Veterinary Institute, Oslo, in 1936**].—*Ibid.* 524-536. 3 tables. [English and German summaries].

I. By the end of June, 1937 the eradication scheme for bovine brucellosis in Norway had been in operation for two and a half years. Up to that date, a total of 2,831 herds were detected and declared infected. By July 1937, 2,625 (92·7 %) had no reactors at the last two tests and of them 2,506 (88·5 %) were regarded as completely freed from infection. 325 herds were not yet released from the restrictions. Of these 119 had no positive reactors at the last test and in another 140 herds the eradication work had progressed so far that they would probably be declared clean within a comparatively short time. 206 of the total number of infected herds still harboured positive reactors. Since the scheme came into force, the number of newly detected and notified infected herds has gradually decreased from 162 in the first quarter of 1936 to 42 in the second quarter of 1937.

Graphs are given to show the progress of the eradication work.

II. The Veterinary Institute is the only laboratory which carries out diagnostic work under the scheme of controlling brucellosis in Norway, and during 1936 (the period covered in this report) it examined 72,766 bovine blood samples derived from 7,193 herds, in 3,151 of which abortion had occurred ; there were 3,925 aborting cows in the herds. Abortion was found to be due to brucella

infection in the case of 549 cows in 325 herds. 3,542 samples (4·8%) gave positive, 124 (0·17%) suspicious and 69,100 (94·9%) negative reactions to the aggl. test; when time permitted, complement-fixation tests were carried out. These figures include some repeated tests in certain herds. In addition, 1,711 samples from cows at markets were examined, of which five were positive, one suspicious and 1,705 negative; also 12 placentas of which three gave positive and nine, negative results. One of 13 blood samples from horses and 14 of 17 from goats gave positive reactions. Samples from one sow, two foxes, one g. pig and seven human beings gave negative reactions.

In connexion with the report H. discusses to some extent the problem of latent brucella infections in bovines, its bearing upon the reliability of the aggl. test and its significance for eradication.—Gustav Naerland (Oslo).

Haring, C. M., & Traum, J. (1937). **Observations of Pathogenic and Antigenic Effects of Brucella abortus, United States Bureau of Animal Industry Strain 19.**—*J. agric. Res.* **55.** 117-128. 1 fig. on 1 plate, 3 tables. [14 refs.]

The strain has been cultivated on glucose glycerin agar for approximately five years and has remained unchanged in its relatively low virulence for g. pigs and cattle. When it was grown in plain broth for about four weeks, dissociation occurred, resulting in a predominance of " R " type colonies, but a strain which was sufficiently stable for the production of suspensions for agglutination tests could be maintained by a selection of S-type colonies.

It was shown that after subcutaneous injection of doses of about 200 billion organisms into cattle, the strain may be isolated from the blood up to the 22nd day, and from the subcutaneous tissues near the point of injection up to the 24th day. When injected (subcut.) into pregnant cows, it may produce typical brucellosis, accompanied by transient bacteraemia, exudative and necrotic placentitis and the discharge of large numbers of organisms at the time of parturition. When non-pregnant cattle were kept in close association with non-vaccinated cattle for over three years, there was no evidence of spread to non-vaccinated animals. Vaccination of mature non-pregnant heifers produced a definite resistance to exposure by the introduction of 1½ billion virulent *Br.a.* (strain U.C.V.36) into the conjunctival sac. This resistance lasted for at least two years. The resistance may, however, be overwhelmed by larger doses followed by a vigorous massage of the eyelids.

Infection of adult cows with virulent strains of *Br.a.* produced a stronger resistance to subsequent infection than was produced in younger cattle by vaccination of strain 19.

Whilst the data regarding vaccination of cattle aged 4-16 months are small, they tend to indicate that the agglutinin titre usually vanishes within a year, and that only a small percentage of such animals can withstand severe conjunctival exposure, at any rate when they are maintained on the low vitamin A intake available in the autumn and winter months on the average California coast range. Calfhood vaccination does, however, appear to inhibit the bacteraemia which frequently follows conjunctival exposure of cattle to virulent *Br.a.*—A. W. Stableforth.

I. Huddleson, I. F., Scales, J. W., & Sorensen, O. J. (1936). **Non-Specific Agglutination in the *Brucella* Group.**—*Tech. Bull. Mich. agric. Exp. Sta.* No. 149. pp. 5-20. 5 tables. [Numerous refs.]

II. Hershey, A. D., & Huddleson, I. F. (1936). **The Chemical Examination of an Avirulent Strain of *Brucella abortus*.**—*Ibid.* pp. 21-23. 1 table. [4 refs.]

III. Scales, J. W., & Huddleson, I. F. (1936). **A Study of *Brucella abortus*-Infected Tissues as Immunizing Agents against Brucella Infection in the Guinea Pig.**—*Ibid.* pp. 24-27. [9 refs.]

IV. Huddleson, I. F., Johnson, H. W., & Meyer, D. B. (1936). **A Method for Measuring the Opsonocytophagic Power of the Blood of Cattle for *Brucella*.**—*Ibid.* pp. 28-34. 2 tables. [2 refs.]

V. Huddleson, I. F., Johnson, H. W., & Beattie, C. P. (1936). **Undulant Fever. A Report of 100 Cases Treated with Brucellin.**—*Ibid.* pp. 35-51. 4 tables. [15 refs.]

I. The results of an examination of 410 bovine and 240 porcine strains of *Brucella abortus*, and 140 strains of *Br. melitensis*, which were studied by means of the thermo-agglutination test over a period of three years, showed that the tendency to the phenomenon is mutable in character, but that once it has occurred in a strain, it may be expected to occur again although dissociated strains may be heat-stable for long periods. Even partially dissociated strains are unreliable for the aggl. test.

The thermo-agglutination reaction serves as only a rough test for the detection of rough or dissociated variants and cannot be entirely depended on as a test for the selection of cultures suitable for the aggl. test. Some evidence was obtained that heat instability is due primarily to changes in the chemical constitution of the cell.

Agglutination due to the presence of agar in the suspension and thermo-agglutination are distinct phenomena. The heating of brucella suspensions containing dissolved agar to a high temperature in order to obtain agglutination is only necessary if the agar is present in the high dilutions. High dilutions of agar do not affect specific agglutination.

II. A description is given of the occurrence and properties of various cellular fractions of an avirulent strain of *Br.a.* and these are compared with those of normal strains. The chief differences consisted of serological dissimilarities between the protein fractions, and the absence in the avirulent strain of a conjugated protein constituent which was largely responsible for the toxicity and serological properties of the virulent strain.

III. The infected tissues tested consisted of the spleens of infected g. pigs and infected exudate from foetal membranes which had been so treated as to render them non-infective. The results showed that treatment with chloroform or formalin which was sufficient to render them non-infective also destroyed their value as immunizing agents.

IV. A preliminary note on a method by which it is claimed that the degree of immunity of cattle against brucella can be determined. The methods consist of measuring the phagocytic activity of the polymorphonuclear leucocytes in an " opsono-cytophagic system " [see also Priestley, below].

V. Brucellin was given in gradually increasing doses by the intramuscular route. Good results are reported in most cases. No controls of any kind were included. In 33 cases the aggl. test was negative and in many the accepted signs of undulant fever were absent. In these cases, diagnosis was made on the basis of a standardized allergic test and the opsono-cytophagic test already described. It is claimed that these are indispensable for accurate diagnosis in a large percentage of cases and are of value in determining recovery. The authors themselves discuss certain sources of possible error in diagnosis, and those interested should refer to the original.—A. W. Stableforth.

Priestley, F. W. (1937). **The Value of the Whole-Blood Phagocytosis Test as a Means of Determining Reactivity to Brucella Infection in Cattle.**—*Vet. Rec.* **49.** 1315-1321. 1 fig., 6 tables. [16 refs.] [Correspondence. p. 1372 and p. 1410].

P. refutes Huddleson's findings on the use of the opsonophagocytic test. The blood of 278 animals, of different ages, a number of which had been inoculated with a living avirulent brucella vaccine, was examined. Counts of polymorphonuclear leucocytes showing phagocytosis of brucella, varied by as much as 80%. P. also shows that :- (1) age is of no significance ; (2) in non-vaccinated animals the degree of phagocytosis is related to the agglutination titre, being greater in low titre than in high titre animals, and (3) non-vaccinated animals have a higher phagocytic activity than vaccinated animals. These results, of course, do not indicate that susceptible and resistant animals can be differentiated by means of this test, as was claimed by Huddleson. The correspondence consists of a criticism of the above paper and P's reply.—A. Wilson Taylor.

Lousse, A. (1937). Un cas de brucellose équine à localisation sternale. [**Sternal Abscess in a Horse with Brucellosis**].—*Ann. Méd. vét.* **82.** 413-416. [2 refs.]

The subject was a five-year-old Belgian horse with a large swelling along the sternum. The tumour was hard to the touch, but presented an oedematous surface and two fistulae, neither of which originated in bony tissue. The animal's gait was affected, the front legs being abducted, so that progress was difficult. The blood serum gave a positive reaction to a living brucella antigen of 1 : 400 to 1 : 800. Two different antigens were used for intradermal tests and both gave a strongly positive reaction. Apparently no cultural examination of the lesion was made.—A. Wilson Taylor.

Lorscheid, W. (1937). Abortus-Bang beim Pferde. [**Equine Brucellosis**].—*Berl. tierärztl. Wschr.* April 23rd. 260.

Lorscheid describes infection with *Brucella abortus* in a two-year-old cart horse. The chief symptoms included difficulty in rising, a stiff neck which interfered with grazing, and gradual emaciation. A fistula was also present on the left side over the last rib. The infection was diagnosed by the agglutination test and a brucella vaccine was given over a period of four weeks. After two months improvement began ; the stiffness disappeared and the wound healed. Brucella infection was not diagnosed amongst the cows on the farm, but it was ascertained that the animal had received much cows' milk as a foal.—A. W. Stableforth.

Schoop, G. (1937). Ueber die Empfindlichkeit des Nerzes gegen Botulinusgift. [**Susceptibility of Mink to Botulism**].—*Dtsch. tierärztl. Wschr.* **45.** 427-428. 1 fig.

It is stated that mink can be killed by the subcutaneous injection, but not by the feeding, of botulinus Type A toxin. It is concluded that botulism is not a natural disease of mink.—P. S. Watts.

Bendinelli, C. (1935). Sui microorganismi pathogeni della patina linguale degli animali domestici. [**Pathogenic Organisms on the Tongues of Domestic Animals**].—*G. Batt. Immun.* **15.** 917-923. 8 figs. on 1 plate. [2 refs.] [English, French and German summaries].

Scrapings were taken from the tongues of an unstated number of healthy horses, cattle, sheep and pigs and were inoculated into the ear veins of rabbits,

and simultaneously cultured on agar. The following bacteria were recovered :- *Bacterium coli*, Friedlander's pneumonia bacillus, a *Pasteurella*, *Mycobacterium tuberculosis*, Schutz's *Diplococcus* and *Bact. prodigiosum*.—J. E.

DISEASES CAUSED BY PROTOZOAN PARASITES.

Bevan, L. E. W. (1937). **Notes on the Treatment and Prevention of Trypanosomiasis.**—*Vet. J.* **93.** 368-376. [18 refs.]

Control of disease due to trypanosomes by destruction of tsetse fly and wild animals has a limited effectiveness owing to infection being wide-spread and often located in inaccessible country. Treatment by means of drugs, and its limitations, are discussed. " Immunity tolerance " produced by the use of drugs such as potassium antimony tartrate caused the treated animals to remain healthy when returned to the " fly area ", but if animals were sterilized of the parasite by treatment, they again became susceptible. In 1928, B. introduced this method of protecting cattle against trypanosomiasis. Certain drugs have beneficial effects in the case of one trypanosome, but are not so useful against others, and effects vary with different species of animals. The electrical charge of the trypanosome and plasma alters in relation to immunity and this phenomenon is of importance in chemotherapy. Brutsaert and Henrard [below] state that they were able to cultivate certain trypanosomes *in vitro*, and that some retained pathogenicity for 156 days ; this discovery may prove of use in producing immunity. There is some evidence of toxin production during infection, and if this could be isolated, it might be used to produce an antitoxic immunity.—S. J. Gilbert.

Brutsaert, P., & Henrard, C. (1936). Het kweeken van pathogene trypanosomen. Voorloopige mededeeling. [**Culture of Pathogenic Trypanosomes**]. —*Ann. Soc. belge Méd. trop.* **16.** 457-478. 3 tables. [Numerous refs.] [In Flemish]. [Also appeared in *Geneesk. Tijdschr. Ned.-Ind.* **77.** 177-180].

The authors succeeded in cultivating trypanosomes for considerable periods. The following media were found useful :- (1) equal parts of citrated human blood and Ringer's solution ; (2) the same with Locke's solution in place of Ringer's ; (3) medium No. 1 with cholesterol added ; (4) medium No. 1 with peptone and gelatin added, and (5) citrated human blood with Tyrode's solution.

Strains of *Tryp. gambiense* grew for 19-49 culture passages extending over 161-428 days. *Tryp. brucei* grew for 24 passages over 206 days and *Tryp. congolense* for 36 passages over 339 days.—J. E.

I. T'ung, T. (1938). *In vitro* **Photodynamic Action of Methylene Blue on** *Trypanosoma brucei*.—*Proc. Soc. exp. Biol., N.Y.* **38.** 29-31. 1 fig. [5 refs.]

II. T'ung, T., & Ma, Y. C. (1938). **Hyperlipemia in Experimental Trypanosomiasis of Rabbits.**—*Ibid.* 103-106. 1 table. [12 refs.]

I. T. records that if *Tryp. brucei* is exposed to methylene blue at a dilution of 1 : 100,000 in citrated blood from which the cells have been removed, and irradiated by a 100 watt lamp, the trypanosomes become non-motile and non-infective. The structure of trypanosomes treated in this way remains unaltered after keeping for a month at a temperature of 37°C.

II. Comparisons were made of the fat and cholesterol contents of the plasma of five rabbits infected with *Tryp. brucei* and four controls. The fat and cholesterol in the controls showed considerable variation, but in the four infected animals which survived, the fat rose to 33, 18, 5 and 3 times that of the controls, and the

cholesterol to 10, 6, 3 and 2 times their amount. G. pigs, subjected to an overwhelming infection with the same strain of *Tryp. brucei*, did not show any increase of blood lipoids.—U. F. RICHARDSON.

TALIAFERRO, W. H. (1938). **The Effects of Splenectomy and Blockade on the Passive Transfer of Antibodies against Trypanosoma lewisi.**—*J. infect. Dis.* **62.** 98-111. 5 tables. [16 refs.]

Reviewing the literature on the passive transference of antibodies, T. indicates the general assumption that when the antigen is opsonized and phagocytosis occurs, the phagocytes of the protected animal are essential to the action of the antibody, but that when the reaction is purely serological they are not involved. Working with the antibodies against *Tryp. lewisi* infection in rats, it was found that passive transference of " ablastin ", the antibody inhibiting multiplication, was as effective in splenectomized rats as in normal controls, but that in splenectomized rats the passive immunity only lasts a few days, whilst in normal rats it is augmented by a developing active ablastic immunity. The passive transference of the trypanocidal antibody was slightly impaired by splenectomy, and only lasted a few days, whilst in normal rats the few trypanosomes which survived failed to multiply owing to the development of active ablastic immunity. Trypanosomes sensitized with the trypanocidal antibody are removed from the circulation as quickly in splenectomized rats as in normal animals.—U. F. RICHARDSON.

PERLA, D. (1937). **The Effect of an Excess of Vitamin C on the Natural Resistance of Mice and Guinea Pigs to Trypanosome Infections.**—*Amer. J. Hyg.* **26.** 374-381. [Numerous refs.]

An excess of ascorbic acid had no influence on the course of *Trypanosoma equiperdum* infection in mice. In g. pigs, however, excess ascorbic acid appeared to raise the resistance to *Tryp. brucei* infection when administered for six weeks prior to and throughout the course of infection. Administration for longer periods appeared actually to lower the resistance of g. pigs.—N. J. SCORGIE.

I. LAMBORN, W. A. (1937). **The Incidence of Sleeping Sickness in Ngamiland, Bechuanaland Protectorate.**—*Annu. Med.* (*sanit.*) *Rep. Bechuanaland, 1935.* pp. 36-52.

II. LAMBORN, W. A. (1937). **Annual Report of the Medical Entomologist for 1936.**—*Annu. med. Rep. Nyasald, 1936.* pp. 43-44.

I. The disease was first diagnosed in the Protectorate in 1934, when only two cases were found. A systematic survey suggests that :– (a) the southern swamp area is free, and it is doubtful if the disease ever occurred in that area, and (b) the two infected individuals (policemen) caught the disease in a minor epidemic among wandering Bushmen, who live in " fly " areas—their hunting grounds.

II. The recession of the tsetse fly towards the north continues. Experiments on the transmission of flagellates passed by *Glossina morsitans* had negative results. Numerous attempts to obtain a strain of *Trypanosoma theileri* locally for work on its transmission failed.—F. J. ANDREWS.

MARSH, H. (1938). **Healthy Cattle as Carriers of Coccidia.**—*J. Amer. vet. med. Ass.* **92.** 184-194. 3 figs., 1 table. [10 refs.]

A modification of Lane's flotation method, to allow the examination of 10 g. of faeces, gave excellent results in the search for coccidia in the faeces of healthy calves. It is concluded that coccidia are normal parasites of the intestines of cattle. Further it is thought that *Eimeria smithi* is of little moment as a cause of clinical

disease, and *E. zurnii* was demonstrated frequently enough to justify its being considered a normal parasite of the intestines of cattle and therefore always a potential danger, when the natural resistance of the host is lowered. [It has been noted in Northern Rhodesia that acute coccidiosis in calves always occurs sporadically and that it is rare to find more than one animal affected at a time in a herd]. —H. S. PURCHASE.

ELLIS, C. C. (1936). **Avian Coccidiosis. Studies of the Viability of Coccidial Oocysts (E. Tenella).**—*Thesis, Cornell.* pp. 70. 7 tables. [13 refs.] [Thesis not published. Abst. prepared from author's MS.]

No difference was found in the viability of caecal and faecal oocysts. Sporulated oocysts were viable for 28 days at refrigerator temperature (9·8°C.) At (19°C.) they were viable for eight days, while at room temperature (24°C.) they were viable for seven days. The viability of sporulated oocysts when exposed on filter paper was influenced by temperature and relative humidity. Temperatures from 18·3° to 40°C. and relative humidities from 20 to 93 were studied. An increase in the temperature with constant relative humidity hastened the death of the oocysts, as did also a decrease in the relative humidity with a constant temperature. Sporulated oocysts became non-viable after one day in a small incubator with a temperature of 39°C. and a relative humidity of 47. No difference was found in the viability of oocysts exposed on filter paper and on eggs. Unsporulated oocysts did not develop when placed on filter paper or eggs and exposed in a small electric incubator. Sporulated faecal and caecal oocysts became non-viable after 22 hours' exposure on filter paper and eggs in a small electric incubator having a temperature of 39°C. and a relative humidity of 56%. Fertile eggs contaminated with sporulated and unsporulated oocysts failed to infect chicks hatched with them. Temperature had a marked influence on the sporulation time of caecal oocysts. The oocysts sporulated at 18·3°C. in 40 hours, and in 21 hours at 35°C. The optimum temperature for sporulation was 26·6°C. and occurred after 15 hours. Oocysts did not sporulate after 48 hours' exposure to 4·4°, 37° and 37·78°C. These temperatures did not inhibit subsequent sporulation when the oocysts were exposed to the proper conditions.—HERBERT L. GILMAN.

I. YAKIMOFF, W. L. (1937). Ueber die Ansteckungsfähigkeit des Zebu mit Piroplasmosen. [**The Susceptibility of Zebu Cattle to Piroplasms**].—*Berl. tierärztl. Wschr.* Sept. 10th. 563-566. 4 figs.

II. YAKIMOFF, W. L. (1937). Françaiellose der Rinder in Bessarabien. [**Françaiella Infection of Cattle in Bessarabia**].—*Wien. tierärztl. Mschr.* **24.** 742-744. 1 table.

I. Y. discusses the evidence in favour of the conception that zebu cattle have greater resistance to piroplasmosis than other bovines. He suggests that, as a rule, zebus are exposed to tick infestation from birth, and that they contract infections with babesia, anaplasma and theileria as sucklings, so that adults are, in fact, immune. He states that in the main, the claim to greater resistance is based on field observations which have overlooked this acquired immunity, and that it has been shown experimentally that zebus are susceptible to all species of piroplasms both by inoculation and by tick transmission. Collecting evidence from Madagascar, North Africa, India, Russia and America, he shows that zebus raised free from infection in youth are highly susceptible to all piroplasmal infections as adults.

II. Records examination of smears from cattle infected with piroplasms from Bessarabia, which were recorded as infected with *Babesia bigemina* and *B. bovis*.

On account of the central position assumed by the small form in the corpuscle, Y. concludes that it is *Françaiella caucasica* [*B. argentina*] and not *B. bovis*, which assumes a peripheral position.—U. F. RICHARDSON.

REICHENOW, E. (1937). Ueber die Entwicklung von Theileria parva, dem Erreger des Küstenfiebers der Rinder, in Rhipicephalus appendiculatus. [**The Development of** *Th.p.* **in** *Rh.a.*].—*Zlb. Bakt. I.* (*Orig.*). **140.** 223-226. [6 refs.]

R. compares the descriptions of the development of babesia and theileria in ticks, and mentions that as the name *Babesia major* has already been used for a piroplasm of cattle, he proposes to rename the dog strain, carried by *Rh. sanguineus*, *B. vogeli*. With regard to the development of *Th.p.* he was unable to detect the vermicular, " zygote " forms of COWDRY and HAM [*V. B.* **3.** 612.] or the large irregular forms devoid of a nucleus (sporonts), and suggests these may have represented a mixed infection with babesia. In engorged larvae and nymphs, inclusion bodies were found in the intestinal wall, and it is suggested that when the ticks have moulted and commenced to suck, these bodies migrate to the salivary glands, where they multiply in the cells and are finally discharged into the salivary duct. Development of theileria in the tick is thus confined to multiplication in the cells of the salivary glands, and as in the case of babesia, R. considers the parasite to be more closely related to the Rhizopoda than to the Sporozoa. When the tick moults, the cells of the salivary gland degenerate and are completely reformed, so that the theilerial infection is eliminated and does not persist in the gland to the next stage of the tick.—U. F. RICHARDSON.

LAFENÊTRE, H. (1936). Existence d'Eperythrozoon ovis en France [**Existence of** *E.o.* **in France**].—*Rev. vét., Toulouse.* **88.** 200-201. [1 ref.]

The occurrence of *E.o.* in sheep from the Montpellier district of France is recorded. The presence of this parasite in sheep has been reported from South Africa and Algeria and a description of the morphology of the Algerian type is given. Experimental work is necessary to determine the pathogenicity of the French strain.—J. E. WILSON.

BOISSEAU, R., & NODENOT, L. (1936). Un cas de toxoplasmose spontanée du cobaye observé à l'Institut Pasteur de Brazzaville (A.E.F.) [**A Case of Spontaneous Toxoplasmosis in a Guinea Pig**].—*Bull. Soc. Path. exot.* **29.** 135-141. [Numerous refs.]

The morphology of the parasite, symptoms of the disease and P.M. appearances are described. There was a tendency for the parasite to become localized in the brain and spinal cord following subcutaneous, intravenous or intraperitoneal injection. The disease was transmissible to the rabbit and mouse, and the authors support the opinion of other workers that there is only one species of toxoplasm. —J. E. WILSON.

DISEASES CAUSED BY VIRUSES.

ANON. (1937). Azione profilattica per l'afta in provincia di Modena. [**Prevention of Foot and Mouth Disease in Modena Province**].—*Clin. vet., Milano.* **60.** 180-181.

F. and M. disease has recently been wide-spread in Italy, especially in the northern districts, and in many cases it was impossible to trace the sources of

infection. Outbreaks were reduced by enforcing control measures more strictly and, in some districts, by means of a prophylactic serum-vaccine treatment. No ill effects were reported and treated animals only showed a mild form of the disease. In some cases serum alone was used, the animals being afterwards exposed to a natural infection. This was also successful, but it was found necessary to give a second dose of serum ten days after the first.—J. A. NICHOLSON.

I. HOWITT, Beatrice E. (1937). **The Complement Fixation Reaction in Experimental Equine Encephalomyelitis, Lymphocytic Choriomeningitis and the St. Louis Type of Encephalitis.**—*J. Immunol.* **33.** 235-250. 4 tables. [17 refs.]

II. MARSH, H. (1937). **Losses of Undetermined Cause Following an Outbreak of Equine Encephalomyelitis.**—*J. Amer. vet. med. Ass.* **91.** 88-93. 2 tables. [2 refs.]

I. The paper describes the technique employed in carrying out the c.-f. tests. Immune sera were obtained from hyperimmunized g. pigs, and antigens from the brains of g. pigs and mice that had succumbed to an intracerebral inoculation of virus. The two American types (Eastern and Western) and one Russian type of equine encephalomyelitis were readily differentiated; no cross-fixation occurred when g. pig brain antigen was used, but some cross-fixation was noted between the Eastern and Western strains with mouse brain antigen. There was no cross-fixation between sera of the equine encephalomyelitis group and the viruses of Borna disease, of lymphocytic choriomeningitis and of the St. Louis human encephalitis.

Experiments were conducted to test the effect of heat and of filtration upon the antigens.

II. 300 cases of equine encephalomyelitis occurred in Montana in August, 1936. Five thousand horses received serum and virus, and 150, serum alone. In October and November there was a serious outbreak of disease in the same area. Out of 89 cases, 79 died, although 81 of the affected horses had been immunized; of 860 immunized horses in a non-infected area, all remained healthy. The disease showed acute cerebral disturbance with excitement as the chief symptom. Catarrhal gastro-enteritis was the chief lesion found P.M. Attempts to recover the virus of encephalomyelitis failed.—F. J. ANDREWS.

TOMASEC, I. (1938). Prilog intradermalnoj reakciji za ustanovljenje svinjske kuge. [**The Intradermal Test for Swine Fever**].—*Vet. Arhiv.* **8.** 149-157. [12 refs.] [French summary].

T. studied the value of the intradermal test for S.F. according to SARNOWIEC [*V. B.* **8.** 436.] using 48 pigs affected with S.F., 20 healthy, non-vaccinated ones, and 61 immunized ones. Positive reactions were obtained in 13% of the affected pigs, 15% of the second group, and 31% of the third. T. is, therefore, of the opinion that the method cannot be recommended.—B. OSWALD (KRIŽEVCI).

I. GENEVRAY, J., & DODERO, J. (1936). Le virus rabique fixe de l'Institut Pasteur de Hanoi. [**The Fixed Rabies Virus of the Pasteur Institute, Hanoi, Indochina**].—*Ann. Inst. Pasteur.* **57.** 638-651. 6 tables, 2 graphs.

II. JACOTOT, H., & LE ROUX, J. (1937). Effets produits chez le veau et chez le cheval par l'inoculation intracranienne de virus fixe. Étude d'un vaccin antirabique préparé avec la substance nerveuse centrale de ces animaux. [**The Effects Produced by the Intracranial Inoculation of Fixed Rabies Virus into Calves and Horses**].—*Ibid.* **59.** 517-525. 2 tables. [2 refs.]

III. Remlinger, P., & Bailly, J. (1937). L'urée sanguine dans la rage expérimentale du chien et du lapin. [**Haematuria in Experimental Rabies in Dogs and Rabbits**].—*Maroc méd.* **17.** 366-367. 3 tables.

IV. Remlinger, P., & Bailly, J. (1937). Échec de la vaccination antirabique par voie pulmonaire. [**Failure of Vaccination against Rabies by the Pulmonary Route**].—*Ibid.* 413-414.

V. De Camp, C. E. (1937). **The Prophylactic Vaccination of Dogs against Rabies in a Public Health Program.**—*J. Amer. vet. med. Ass.* **91.** 581-587. 1 table. [15 refs.]

I. This virus was maintained for a large number of serial passages in rabbits (2,033 up to February 1935); its virulence steadily increased for these animals. Paralysis occurs on the sixth day after intracerebral inoculation, and death follows within 48 hours. The incubation period is longer after intra-ocular inoculation or corneal scarification. The rabbit, dog and monkey cannot be infected by subcutaneous inoculation with this strain, and the virus is not infective for the dog when given intramuscularly.

Resistance to desiccation and the action of glycerin decreased during passage; a considerable resistance is shown to the action of ether. The virus is still infective at a titre of 1 : 500,000. It retains its virulence for three months at 41°C. and for six months at 3°C.; it is rapidly destroyed at 60°C. After embedding in paraffin, infected cords are found to remain virulent up to 60 days.

II. An investigation of the use of the horse and the calf for the production of antirabic vaccine in large quantities. The fixed virus was passaged through six horses and six calves respectively and no marked change in the virulence of the virus for these animals was noted at the completion of the sixth passage. In both the horse and the calf symptoms of paralytic rabies were observed; the calf is considered to be the more convenient animal to handle. Also a vaccine prepared from an emulsion of calf brain appears to be more efficacious than one prepared from horse brain. The inoculation of formolized brain emulsions into g. pigs, rabbits and dogs had no ill effect in either case.

III. After the intracerebral inoculation of dogs and rabbits with a fixed strain of rabies virus, a considerable increase occurs in the blood urea content. The maximum is reached at the point of death; the urea content is not dependent upon the age, sex or condition of the animal. In animals immunized against rabies virus the blood urea content remains at its normal level following upon the inoculation of rabies virus.

IV. A series of experiments is described in which attempts were made to immunize g. pigs and rabbits by the repeated inhalation of pulverized material from the spinal cords of rabbits infected with a fixed strain of rabies virus. The majority of the animals so treated succumbed to a subsequent inoculation of street virus.

V. A report of the prophylactic vaccination of dogs in the U.S.A. by the use of a single dose of vaccine. The vaccine is prepared from a fixed strain of rabies virus by attenuation with phenol or chloroform; it is found to confer an immunity of about one year's duration. Although the vaccine does not afford complete protection to all the animals treated, statistics show that there is a great reduction in the incidence of the disease. The vaccine is recommended by public health and army officials as an effective means of the control of rabies.—E. C. H.

I. Chiari, B. (1937). Sopra alcune proprieta biologiche del virus fisso di Asmara e suo comportamento di fronte ad alcuni agenti fisici e chimici. [**The Fixed Rabies Virus of Asmara (Eritrea)**].—*Azione vet.* **6.** 172-173.

II. Peragallo, I. (1937). Ricerche sulla possibilità della cultura del virus rabico nella membrana corio-allantoidea dell'embrione di pollo. [**Culture of Rabies Virus on Chorio-Allantoic Membrane**].—*G. Batt. Immun.* **18.** 289-290. [English, French and German summaries].

III. Savagnone, L. (1937). Sul potere patogeno ed immunizzante di un nuovo filtrato rabbico. [**Properties of a New Rabies Filtrate**].—*Ibid.* 368-380. 5 tables. [6 refs.] [English, French and German summaries].

I. In order to test the virulence of rabies virus used for the production of vaccines, experiments were carried out on rabbits, g. pigs and dogs. In rabbits, the incubation period of the virus, given intracranially, was four days, the paralytic form of the disease being produced with death in 5-6 days. Similar results were obtained when the virus was injected into the anterior chamber of the eye and there appeared to be no loss of virulence after 180 passages in 2½ years. The virus was equally virulent for g. pigs. A course of treatment with a vaccine consisting of a 20% emulsion of virus in 50% glycerin and 0·5% phenol protected dogs when injected with virulent street virus 20 days later.

II. It was possible to cultivate both the fixed and street virus in developing chick embryo, the eggs being inoculated from the 12th to the 14th day of incubation. Material from the chorio-allantoic membrane of such embryos regularly produces rabies when injected subdurally into rabbits.

III. Using a rabies filtrate prepared from emulsion of spinal cord treated with animal charcoal and then filtered through a Berkefeld V candle, S. prepared a phenolized vaccine according to Puntoni's method.

The filtrate maintained its virulence for eight days and the vaccine protected 60-80% of rabbits against subsequent injection with fixed virus. Injection of 5 c.c. of the vaccine (subcut.) completely protected dogs against fixed virus injected either subdurally or into the sciatic nerve; survivors of the first test dose also survived a second test dose given one month later, whereas control dogs died 10 to 12 days after injection with the virus. [It is not clear how this could be regarded as a test of the actual vaccine used].

Vaccinated dogs maintain their resistance for four months after which period it rapidly declines.—J. A. Nicholson.

Jakeman, H. W. (1937). **Some Phases of Rabies and Distemper Control.**—*J. Amer. vet. med. Ass.* **90.** 493-500.

J. criticizes his colleagues for neglect in combating disparaging propaganda concerning immunization against distemper and rabies.

He emphasizes three factors in distemper immunization (1) that the virus be potent; (2) that the pups are not unfit from other affections, anaemia or worms, and even advises previous vaccination against secondary invaders, and (3) the necessity of thorough investigation of alleged failures.

As regards rabies, he advocates education of public opinion and counteraction of misinformed anti-propaganda. He emphasizes the necessity of using proved vaccines and prefers multiple injections rather than single ones. He instances Schneider's intralingual potency test of vaccine as good [*V. B.* **8.** 155].—E. E. J.

Haber, P. (1937). Affinité du virus de la peste aviaire (souche adaptée à la souris), pour l'embryon de poulet. [**Affinity for the Chick Embryo of Fowl Plague Virus Adapted to the Mouse**].—*C. R. Soc. Biol. Paris.* **126.** 885-886. [1 ref.]

An emulsion of the brain and spinal cord of a mouse which had been killed by the virus of fowl plague was inoculated into the chorio-allantoic membrane of

a nine-day-old chick embryo. The chick embryos were examined histologically at regular intervals and the changes found are described in detail. The lesions in the embryos are compared with those in mice inoculated with fowl plague virus. —J. E. Wilson.

Keogh, E. V. (1938). **Ectodermal Lesions Produced by the Virus of Rous Sarcoma.** —*Brit. J. exp. Path.* **19.** 1-9. 8 figs., 2 plates, 2 tables. [6 refs.]

After four serial passages through fowls, material from a typical No. 1 Rous sarcoma was inoculated on the chorio-allantois of developing chicks and passage continued for twenty generations. Discrete ectodermal lesions resulted and these are described in detail.

Inoculation of the affected membranes into fowls resulted in typical Rous sarcomata.

Attempts were made to neutralize the virus with sera of various types, but these failed to influence the development of tumours.—J. E. Wilson.

Galli-Valerio, B. (1937). Recherches sur la psittacose. [**Research on Psittacosis**].—*Schweiz. Arch. Tierheilk.* **79.** 525-531. 1 fig. [5 refs.] [In French].

The author describes experiments with material from three cases of human psittacosis and two cases of avian origin. A patient acquired the disease from parakeets, and the house surgeon and nurse were in turn infected by the patient.

The lesions in mice, canaries and sparrows are discussed. The author considers that the intra-peritoneal inoculation of mice with suspected material is the best method of diagnosing the disease. Rickettsiae were demonstrated in all the experimental cases, being found in the endothelial cells of the peritoneal exudate, spleen, liver and kidneys.—J. E. Wilson.

Médysnki. (1937). A propos de la psittacose. [**Psittacosis**].—*Rev. Path. comp.* **37.** 326-336.

M., who has himself been affected with psittacosis, points out that the disease is commoner in France than is generally supposed.

The danger of the disease is stressed and it is pointed out that spectacles should always be used to protect the eyes when autopsies are being made.

It is suggested that psittacosis should be made notifiable, as controlling importation cannot alone eradicate the disease.—J. E. Wilson.

MacCallum, F. O. (1936). **The Necessity of Living Cells for the Cultivation of Psittacosis Virus.**—*Brit. J. exp. Path.* **17.** 472-481. 4 tables. [8 refs.]

The author describes in detail experiments he carried out to determine whether psittacosis virus could be cultivated extracellularly. He attempted cultivation in cell-free medium and titrated the virus present before and after incubation at 37°C. for three days by intradermal inoculation of rabbits. The results obtained support the view that the virus is an obligatory intracellular parasite.—J. E. W.

Lacassagne, A. (1937). Etat réfractaire de la peau irradiée du lapin au développement de certains virus. [**Resistance of Irradiated Rabbit Skin to Viruses**]. —*C. R. Soc. Biol. Paris.* **125.** 96-98. [3 refs.]

Portions of the skin of two rabbits were irradiated and two days later inoculations of the virus of contagious papillomatosis were made into those areas and into portions of the untreated skin. Twelve rabbits whose skins had previously been subjected to irradiation received inoculations of vaccinia virus into treated and untreated areas of skin. No reaction occurred in the irradiated areas in either

case, but typical lesions were produced in the untreated skin, leading L. to conclude that irradiated skin is resistant to the development of certain viruses.—J. E. W.

LUSH, Dora. (1937). **The Virus of Infectious Myxomatosis of Rabbits on the Chorioallantoic Membrane of the Developing Egg.**—*Aust. J. exp. Biol. med. Sci.* **15.** 131-139. 4 figs., 4 tables. [7 refs.]

With the object of investigating the suitability of the virus of rabbit myxomatosis as a means of controlling the excessive increase in wild rabbit populations in Australia, experiments were carried out by MARTIN in England and BULL in Australia. The results of tests in experimental colonies of rabbits were encouraging, and these workers were unable to infect domestic animals and many of the more common Australian wild animals. As it was thought that failure to grow on the egg membrane would further confirm the extreme species specificity of the virus, L. carried out the work described which, however, showed that lesions similar to those produced by other viruses may readily be produced by material taken direct from rabbit lesions, and that there is no loss in pathogenicity either for the rabbit or for the chick embryo by continued egg passage.

L. considers that this susceptibility of the egg membrane does not suggest a latent power to infect species other than the rabbit. The technique described is recommended as a simple, inexpensive and reasonably accurate method for the quantitative study of the virus.—T. S. GREGORY.

WOGLOM, W. H., & WARREN, J. (1938). **A Pyogenic Virus in the Rat.**—*Science.* **87.** 370-371.

This is a preliminary note to be followed by a more complete description of a hitherto unknown virus causing necrosis and pus formation in the subcutaneous tissues of white rats. It was discovered during passage experiments with rat sarcoma, abscesses sometimes arising at the point of inoculation although all material had proved bacteriologically sterile before use. Aerobic and anaerobic cultures from the abscesses consistently proved sterile. Mice are susceptible, rabbits partly susceptible and g. pigs insusceptible. The virus is being passaged on the chorio-allantoic membrane of chicks.

ZINSSER, H. (1937). **The Rickettsia Diseases. Varieties, Epidemiology and Geographical Distribution.**—*Amer. J. Hyg.* **25.** 430-463. 3 figs., 3 tables. [Numerous refs.]

Z. first defines rickettsiae as pleomorphic micro-organisms, usually seen in short bacillary or diplococcal form, which may—according to environmental conditions, species of host, or degree of crowding in cells—look like minute coccobacilli, or appear as longer, straight or curved filaments approximating small bacteria in size. They usually stain a faint purple by Giemsa's stain, the optimum pH of the stain being about 7·4 for pathogenic species. Differentiation from the tissue elements in smear preparations is effected by treating with a weak acid. For the cultivation of rickettsiae tissue culture is essential and cells merely alive and not actively growing promote the best growth. Z. assumes that rickettsiae were originally insect parasites which have come to mammals and, eventually, to man through the bites of insect vectors.

A classification of these diseases is largely based on :– (1) cross-immunization ; (2) insect vectors ; (3) behaviour in experimental animals ; (4) localization of the parasites in mammals and insects, and (5) histopathology. Corroborative evidence is also obtained by serum reactions with several OX proteus strains of Weil and

Felix, from artificial active and passive immunization, and from tissue culture results.

The diseases discussed by Z. are those of human beings.—C. V. Watkins.

PARASITES IN RELATION TO DISEASE [GENERAL].

Mikačić, D. (1938). Paraziti naših ovaca. [**Parasites of Sheep in Yugoslavia**]. —*Vet. Arhiv.* **8.** 114-140. 2 figs., 1 table, 1 chart. [Numerous refs.] [French summary].

Fifty sheep from the north-western regions of Yugoslavia were examined for parasites. Helminths found were :– *Dicrocoelium lanceatum*, 38 times ; *Fasciola hepatica*, 11 times ; *Paramphistomum cervi*, once ; *Moniezia sp.*, 13 times ; *Helictometra giardi*, six times ; *Taenia hydatigena* cysts, 19 times ; *Echinococcus granulosus* cysts, 12 times ; *Strongyloides papillosus*, once ; *Oesophagostomum venulosum*, twice ; *Chabertia ovina*, 14 times ; *Bunostomum trigonocephalum*, 18 times ; *Trichostrongylus colubriformis*, nine times ; *Tr. extenuatus*, 23 times ; *Tr. capricola*, six times ; *Tr. vitrinus*, five times ; *Cooperia curticei*, three times ; *Ostertagia ostertagi*, seven times ; *O. circumcincta*, 24 times ; *O. trifurcata*, ten times ; *Haemonchus contortus*, 14 times ; *Nematodirus filicollis*, 11 times ; *Dictyocaulus filaria*, 29 times ; *Protostrongylus rufescens*, seven times ; *Protostrongylus sp.*, 23 times ; *Muellerius capillaris*, five times ; *Neostrongylus linearis*, five times ; *Gongylonema pulchrum*, 24 times ; *Trichuris ovis*, 15 times, and *Capillaria sp.*, once.

Arthropods found were :– *Linguatula serrata*, larv. ; *Trichodectes ovis* ; *Linognathus pedalis* ; *Melophagus ovinus* ; *Oestrus ovis*, larv. ; *Ixodes ricinus* ; *Dermacentor marginatus* ; *Psoroptes ovis* ; *Chorioptes ovis*, and *Dermanyssus gallinae*. —B. Oswald (Križevci).

—. (1938). **Report of the Committee on Parasitic Diseases** [**U.S. Live Stock Sanit. Ass.**]—*J. Amer. vet. med. Ass.* **92.** 429-433.

The committee feels that the attention paid to *Haemonchus contortus* has obscured the importance of other nematodes of sheep, *e.g. Ostertagia*, *Nematodirus* and *Trichostrongylus*.

In fluke areas severe losses occur from the toxin elaborated by *Clostridium oedematiens* in fluke infested livers ; such losses might be avoided by vaccination [see *V. B.* **1.** 35].

Clinical coccidiosis in cattle can be prevented, it is believed, by maintaining the general vigour and resistance at a high level and so preventing the multiplication of coccidia normally present in small numbers.

Attempts are being made to ascertain the prevalence of trichomoniasis in cattle and its relation to sterility.

The report also considers parasites of wild animals, birds and fish and their transmission to man and domestic animals.—E. E. Jelbart.

PARASITES IN RELATION TO DISEASE [ARTHROPODS].

I. Morison, G. D. (1937). **Some Results of Trapping the Sheep Blowfly.** (*Lucilia sericata* **Meigen**).—*Scot. J. Agric.* **20.** 123-134. 1 table. [Numerous refs.]

II. Oldham, J. N. (1937). **The Sheep Blowfly Problem in Great Britain.**—*Vet. Rec.* **49.** 1265-1271. [9 refs.]

I. From a series of trapping tests carried out with liver and sodium sulphide baits in 1933 and 1934, M. found that a sunny sheltered site was most favoured

by blowflies, but that the numbers of flies caught also depended on the density of sheep stocking in the immediate vicinity. *L.s.* was trapped from early June to the end of September; the highest catches were obtained in early August. This species formed only about 3% of the total catch, which consisted principally of carrion flies, and trapping for blowfly control is not therefore considered to be of much value.

Most flies were caught on warm sunny days without wind; fewer on bright days with occasional rain, or muggy days, while wind or frequent rain reduced the catches considerably.

II. A general review of the sheep maggot fly problem in Britain, summarizing the work published in the last few years. The information is principally obtained from two articles already noticed [*V. B.* **8.** 96 and 292].—J. MacLeod.

Belschner, H. G. (1937). **Studies on the Sheep Blowfly Problem. I. A Review of the Sheep Blowfly Problem in New South Wales. II. Observations on Fleece Rot and Body Strike in Sheep, particularly in regard to their Incidence, Type of Sheep Susceptible, and Economic Importance.**—*Sci. Bull. Dep. Agric. N.S.W.* No. 54. pp. 7-60 and 61-95. 22 figs., 28 tables, 10 graphs, 8 charts, 2 maps. [Numerous refs.]

Seddon, H. R. (1937). **Studies on the Sheep Blowfly Problem. III. Bacterial Colouration of Wool.**—*Ibid.* pp. 96-110. 2 figs., 1 table. [11 refs.]

Seddon, H. R., & Belschner, H. G. (1937). **Studies on the Sheep Blowfly Problem. IV. The Classification of Sheep According to Susceptibility to Blowfly Strike. V. Relationship of Rainfall to Crutch Strike by Sheep Blowflies.**—*Ibid.* pp. 111-122 and 123-126. 18 figs., 1 table, 9 charts. [1 ref.]

I. B. reviews the sheep blowfly problem in New South Wales, dealing firstly with its extent and economic importance which are influenced by a variety of factors, of which the most important are climate and the breed and type of sheep. Rainfall, temperature and humidity affect both the activity of the adult flies and the development on the sheep of an area attractive to the fly and favourable for strike. A map illustrates the distribution of sheep, and the incidence of fly strike.

It is difficult to estimate the economic loss, but it has been quoted as £4,000,000 a year. A number of tables show details of how losses are sustained.

The predisposition of individual sheep to fly strike is discussed under the following headings:– crutch strike, body strike, head strike, pizzle strike, etc. It is concluded that the sheep most commonly struck had wrinkled breeches and this appeared to be the constant predisposing factor to crutch strike. Conversely, sheep which had not been struck had plain breeches. Ill-health appeared to be a negligible predisposing factor. Malformation of the vulva, deflecting the urinary stream on to the wool of a wrinkle and bad conformation of the hindquarters with hocks close together were predisposing factors.

The relative susceptibility of individual sheep of the same age to fleece rot and body strike is dependent on the "quality" (character, handle and colour) of the wool, conformation of the withers, and the density of the fleece (particularly over the withers).

Measures for prevention and treatment of blowfly strike are dealt with under crutching, jetting, poisoning and trapping, dipping, fold removal operation (Mules' operation), and dressing of struck sheep. Experiments dealing with breeding as a means of reducing strike are described, and it is shown that selection and breeding from sheep with plain, non-wrinkly breeches, resulted in marked decrease in susceptibility and incidence. The fears of certain sheep breeders regarding the

elimination of wrinkles are discussed and typical A (plain bodied) and C (wrinkly) class sheep are described and illustrations are given.

II. B. records observations on fleece rot and body strike, paying special attention to incidence, type of sheep susceptible and economic importance. The mass of information given cannot be condensed into a form which would be of value to other workers, who should consult the original article.

III. S. discusses bacterial discoloration of wool and gives a useful key to the chief characters of coloured wools.

IV. The authors discuss the classification of sheep according to susceptibility to blowfly strike. The terms used, *e.g.* crutch strike, etc. are defined, and sheep are classified into three types :– class A, relatively insusceptible ; class B, moderately susceptible, and class C, definitely predisposed to strike. Experience has shown that by gradual elimination of C class sheep and the worst type of the B class, breeding for insusceptibility can be practised and flocks improved with regard to uniformity of conformation and wool quality and reduction of crutch strike. The variations in degree of wrinkliness of the breech area are discussed, and illustrated by diagrams and photographs. Sheep are further classified according to susceptibility to fleece rot and body strike.

V. A summary of the relationship of rainfall to crutch strike. A number of graphs show that, whilst total rainfall is important, it is its distribution that affects not only the amount of strike, but also the duration of waves of strike.—H. Mcl. G.

Natvig, R. L. (1937). Om kubremsene og deres optreden i Norge. [**Ox Warbles in Norway**].—*Norsk VetTidsskr.* **49.** 171-204, 217-251, 271-298, 335-358, 378-406 and 436-470. 24 figs., 2 plates. [Numerous refs.] [English summary].

N. gives an extensive review of the ox warble fly, its life-history, biology, etc., and through information obtained as a result of enquiries sent out to veterinary surgeons and a few farmers he has been able to map [Fig. 22, p. 395] the distribution of the fly as it occurred in 1936 in the different counties, compared with earlier years.

On the map it is shown that the fly does not occur evenly all over the country, being most frequent in two special areas, the south-western and central parts of southern Norway. In 1936 it was reported up to Nord-Trøndelag county (64°N.), whereas in earlier years it was common up to Vefsen (67°N.) In general, the flies seem to have been more frequent 30-50 years ago than now. *Hypoderma lineatum* is commoner than *H. bovis*. Finally some outlines for any eventual governmental scheme for its control are discussed. For details the rather extensive English summary should be consulted.—Gustav Naerland (Oslo).

I. Pedretti, L. (1936). Zur Bekämpfung der Dasselplage 1936 in Oberbayern und im Allgäu. [Einwaschversuche am Höhenvieh mit derrishaltigen Waschmitteln). [**Ox Warble Fly Control in Upper Bavaria and Allgäu in 1936**]. —*Münch. tierärztl. Wschr.* **87.** 529-534. 4 tables.

II. Keller, H. (1937). Ein neuer Vorschlag zur Bekämpfung der Dasselschäden. [**Suggestion for Control of Ox Warbles**].—*Ibid.* **88.** 40-42. [17 refs.]

III. Goerttler. (1937). Verbreitung der Dasselplage in Preussen im Jahre 1936. [**Ox Warbles in Prussia in 1936**].—*Berl. tierärztl. Wschr.* April 2nd. 209-212. 1 table.

IV. Bartels, & Claassen, P. (1937). Die Durchführung des Dasselgesetzes im Regierungsbezirk Schleswig im Jahre 1936. [**Ox Warble Control in Schleswig in 1936**].—*Ibid.* 212-216. 1 table.

V. Bartels. (1937). Welche Erfolge hat das Dasselgesetz vom Jahre 1933 bis jetzt gezeitigt? [**Results of the Ox Warble Law since 1933, Germany**].—*Tierärztl. Rdsch.* **43.** 211-213. 1 table. [2 refs.]

I. P. tried the following substances commonly used in Germany :– Derrophen (Behring), Derrilavol (Marienfelde), Derrisol (Bengen), Abdassol (Schering-Kahlbaum) and Laurus (Lorbeer). Altogether 1,193 animals with 11,122 warbles were treated, by the application of a wash to the skin of the back. The result showed 430 empty warbles, 9,410 dead larvae and 1,282 living larvae. The toxic action of the drugs was satisfactory on the first and second stages of the larvae, but unsatisfactory on the third. There were no ill effects on the animal treated.

P. concludes that provided the treatment is done effectively, chemical substances in conjunction with the extraction hook are the best way of exterminating the warble fly.

II. K. casts doubt on the generally accepted theory that newly hatched larvae of warble flies penetrate the skin of the limbs and migrate slowly through the body to reach the back by the spring of the year after the eggs are laid. He suggests that the larvae migrate directly to the back and arrive there before the passing of the summer during which they are deposited as eggs, and hence advocates the use of derris wash in autumn when they return from pasture, instead of in spring as is done at present. [K. does not support his theories with sufficient evidence to warrant his emphatic statements].

III. In 1936 the total incidence of warbles in Prussia was smaller than in the previous year; the incidence was highest in the north and eastern districts. There was an increase in incidence in the months of May to August.

IV. The treatment of whole parishes together against the warble fly was very effective. At least two treatments before going to grass and one afterwards are essential. The effects of the temperature in the cowshed on the development of the larvae, and the action of the remedies, have still to be studied.

V. The amount of infestation has not been appreciably changed by the law of 1933 concerning the campaign against warble flies. Stricter organization is essential. Statistics about warble infestation should be compiled for the whole Reich.—A. W. Möller.

Brumpt, E. (1937). Facteurs qui agissent sur la transmission des infections par les arthropodes hématophages. [**Factors Influencing Transmission of Infection by Bloodsucking Arthropods**].—*Ann. Parasit. hum. comp.* **15.** 74-85.

B. discusses the relationships of germ, vector and definitive host, and the intrinsic and external factors which affect the transmission of germs. Thus, the insect vector will vary in efficacy according to its powers of survival in nature, the probability of finding the definitive host, the agreement between its seasonal activity and the accessibility of the germ, the ability of the germ to develop in the invertebrate host, the reaction of host to germ, etc. The vertebrate host can modify profoundly the characters of the germ; climate affects it by limiting its geographical range and in other ways, and the activities of mankind—wars, colonization, and the like—are all concerned in the interplay of factors influencing transmission. The paper is almost entirely a review and collation of existing knowledge, and cannot be abstracted.

In reference to the role of the vector, B. advances arguments to refute the theory that the vector of an infective agent can modify the biological characters of the agent, so that differing strains of the same organism result from its passage

through different vectors. Thus, the Dakar strain of *Spirochaeta duttoni*, transmitted by *Ornithodorus erraticus*, has the same characters as the equatorial African strain transmitted by *O. moubata*, while *Sp. hispanica*, also transmitted by *O.e.*, has retained its distinctive characters. He also points out that the mode of transmission of a disease by insect bite, or by the insect dejecta becoming inoculated into scratches, must be considered with regard to which method is the most suitable from the point of the parasite, taking into consideration the particular insect involved, and that transmission by the latter method cannot always be classed as a recent adaptation of a germ to a new or additional intermediate host.—J. MacLeod.

—. (1938). **Report of the Committee on Tick Eradication [U.S. Live Stock Sanit. Ass.]**—*J. Amer. vet. med. Ass.* **92.** 474-478. 1 table.

The quarantined area was reduced in the past year by 9,287 square miles in Florida and Texas, while 2,248 square miles in Florida were re-quarantined because of the continued propagation of the Texas fever tick, *Boophilus annulatus* var. *australis* on deer in certain swampy districts. Legislation authorizing removal and control of deer has been passed, but is being contested in the courts. With Arkansas and Mississippi now added, 12 of the 15 originally tick-infested States are now completely free from fever tick infestation.—E. E. Jelbart.

I. Philip, C. B. (1937). **Six Years' Intensive Observation on the Seasonal Prevalence of a Tick Population in Western Montana.**—*Publ. Hlth Rep., Wash.* **52.** 16-22. 1 fig., 1 table. [1 ref.]

II. Sergent, Ed., & Poncet, A. (1937). Tableau de la répartition saisonnière des tiques les plus répandues en Algérie. [**Table of the Seasonal Distribution of the Ticks of Algeria**].—*Arch. Inst. Pasteur Algér.* **15.** 220-224. 3 figs. [9 refs.]

I. P. gives a preliminary account of the results of a quantitative survey during the period 1930-1935 of the active adult population of *Dermacentor andersoni* on a 40 acre tract in the Bitter Root Valley, Montana. Samplings were made by sweeping the herbage with a flag over the same track each week, captured ticks being immediately liberated. The parasitization season was found to be from February or March, when the snow began to disappear from patches of the vegetation, until the end of June, the peak period being in April. Ticks were obtained by the sweep method at midnight, indicating that they do not leave the vegetation with nightfall. Marked ticks were recovered after two seasons, indicating their ability to survive unfed for over a year under natural conditions.

II. In the course of work on piroplasmosis transmission the authors collected ticks from domestic and wild animals over a period of 11 years, both in the high plateau area of Algeria and on the low-lying littoral plains. Analysis of the collections of the seven principal species shows that *Rhipicephalus bursa* and *Hyalomma mauritanicum* were the most numerous, totalling 45% and 30% respectively of the numbers of ticks collected; *Hyalomma aegyptium*, *Haemaphysalis punctata*, *Rh. sanguineus* and *Boophilus calcaratus* occurred in smaller numbers, and *Ixodes ricinus* was relatively scarce. [The figure 27 given for this species is obviously a mistake.]

The seasonal distribution of each species in the collections made is analysed; *I.r.* is a winter species, and *Rh.s.* and *Hyalomma aegyptium* are summer species; *Haemaphysalis punctata*, *Hyalomma mauritanicum*, and *Rh.b.* have different seasons for the adult and immature stages; *B. calcaratus* occurs throughout the year, except in April and May.—J. MacLeod.

Delpy, L., & Gouchey, S. H. (1937). Biologie de *Hyalomma dromedarii* (Koch 1844). [**Biology of** *H.d.*]—*Ann. Parasit. hum. comp.* **15.** 487-499. 5 figs., 4 tables. [6 refs.]

H.d. was reared experimentally in all three stages on rabbits and calves. In nature, the nymph and adult were found on camels and to a lesser extent on cattle ; the host of the larvae is unknown. Usually a three host tick, it was observed to act occasionally as a two host tick, the gorged larva moulting on the host and attaching as a nymph.

The shortest life cycle obtained experimentally, at Hessarek, Iran, was 93 days, the longest 280. All phases of development, except the feeding periods, were found to vary in duration with the season.—J. MacLeod.

Sanborn, C. E., Stiles, G. W., Jr., & Moe, L. H. (1938). **Anaplasmosis Transmission by Naturally Infected** *Dermacentor Andersoni* **Male and Female Ticks.**—*N. Amer. Vet.* **19.** No. 1. 31-33. [4 refs.]

Under controlled conditions the authors experimentally produced anaplasmosis in a healthy cow by placing on it three female and four male partially fed ticks removed from a cow which had died from anaplasmosis. Subsequently they placed the same four male ticks alone on two other cows, which contracted the disease thus proving that male ticks also transmit the infection.—E. E. Jelbart.

Mellanby, Helen, & Mellanby, K. (1937). **Rearing Tsetse Flies in Captivity.**—*Proc. roy. ent. Soc., Lond.* Ser. A. **12.** 1-3.

Using mainly *Glossina palpalis*, the authors succeeded in keeping the flies alive in London up to 210 days, and in breeding them through four generations. The common cause of mortality in captive flies is starvation. It is necessary to coax the individual flies to feed. Copulation takes place when the flies are 5-8 days old and the act needs at least half an hour for full consummation. Once a female has been successfully inseminated she produces fertile larvae for the rest of her life.—H. S. Purchase.

Van Hoof, L., Henrard, C., & Peel, E. (1937). L'aptitude de *Glossina palpalis* au développement de *Trypanosoma gambiense* est-elle rustique, raciale ou héréditaire ? [**Is the Suitability of** *Gl.p.* **for the Development of** *Tryp. gambiense* **Local, Racial or Hereditary ?**]—*C. R. Soc. Biol. Paris.* **125.** 1037-1039. 2 tables. [3 refs.]

A series of comparative experiments, using tsetse flies bred from pupae laid by wild flies and laboratory-bred flies, were carried out by feeding these flies on naturally infected and artificially infected mammalian hosts. No evidence could be found of any hereditarily acquired immunity in *Gl.p.* against infection by *Tryp. gambiense*. Furthermore, laboratory-bred flies were as effective as wild flies in their ability to transmit *Tryp. gambiense*.—H. S. Purchase.

I. Sulzberger, M. B., & Kaminstein, I. (1936). **Avian Itch Mites as a Cause of Human Dermatoses. Canary Birds' Mites Responsible for Two Groups of Cases in New York.**—*Arch. Derm., Chicago.* **33.** 60-72. 1 fig. [Num. refs.]

II. Garman, P. (1937). **Bird Mites in a Dwelling House.**—*Bull. Conn. agric. Exp. Sta.* No. 396. pp. 406-407. 1 fig.

I. After a review of the literature on mites of animals affecting mankind, the authors give clinical case records of pruritus extending up to seven years' duration, in five persons in two families. In each case *Dermanyssus gallinae* was the mite concerned : it was recovered from an affected canary kept by each family.

II. An account of an invasion of the rooms of a house by swarms of bird mites (*Liponyssus silviarum*), which came from a wild bird's nest near a window. The mites caused " a kind of eczema " about the neck and arms of persons using the rooms.—J. E.

PARASITES IN RELATION TO DISEASE [HELMINTHS].

VIANELLO, G. (1937). Il problema della distomatosi dei bovini in Lombardia. [**Bovine Fascioliasis in Lombardy**].—*Clin. vet., Milano.* **60.** 491-506. 11 figs. on 4 plates. [18 refs.]

Of the numerous drugs which have been proposed for the treatment of fascioliasis, carbon tetrachloride and carbon hexachloride (C_2Cl_6) are the most valuable. CCl_4 is the drug of choice for sheep. Cattle are more sensitive to the action of CCl_4 and in their case C_2Cl_6 should be used. This drug is relatively non-toxic for cattle and appears to be effective in destroying adult flukes in the liver.

In order to reduce the cost and facilitate the administration of C_2Cl_6, vegetable fats may be used as solvents instead of tetrachlorethylene. The melted fat containing the drug is solidified in moulds holding about 40 g. of the mixture. Each mould contains 24 g. C_2Cl_6. The optimum dose of the drug is 24 g. per 100 kg. body weight, and the total dose should be divided into two portions, the second to be given 24 hours after the first. A narcotic effect may be produced, but this rapidly passes off. In districts where the disease is prevalent annual treatment should be given.—J. A. NICHOLSON.

BENNETT, H. J. (1936). **The Life History of** *Cotylophoron cotylophorum*, **a Trematode from Ruminants.**—*Illinois Biol. Monogr.* **14.** No. 4. 119. 81 figs., 18 tables. [Numerous refs.]

This work purports to be the first complete study of an amphistome life-history and the first report of a representative of the genus *Cotylophoron* from the mainland of North America. The experimental method was followed throughout. The only intermediate snail hosts among snails experimented with were *Fossaria parva* and *F. modicella*; eggs obtained from mature worms collected from slaughtered cows were hatched and the life-history stages followed throughout; the latter are described at length.

In B's experiments the hatching of the eggs required 11-29 days, according to the seasonal room temperature, and freezing temperatures were fatal to the eggs. The development and hatching of the miracidium was closely studied at four-day intervals, and coincides with descriptions by previous workers. Unless it found a host it did not live more than 8-10 hours. Sporocysts were found in the mantle, head and foot of the snail. The number of rediae did not exceed nine. They developed rapidly and were born in 9-10 days, when they migrated to the liver or ovo-testis of the host and produced approximately 25 cercariae. Daughter rediae were found in only one snail. Cercariae were born in immature condition and continued to develop within the snail, and were born in 30-91 days after infestation of the snail, according to seasonal temperature. The cercariae encyst within an hour on vegetation and the metacercariae live as long as 5-6 months. Three calves were experimentally infested. The metacercariae became excysted in the duodenum and after 21 days migrated to the rumen and reached maturity in 3½ months.

The complete life-cycle of *C. cotylophorum* varies from about 5-8 months. —E. E. JELBART.

Witenberg, G., & Yofe, J. (1938). **Investigation on the Purification of Water with Respect to Schistosome Cercariae.**—*Trans. R. Soc. trop. Med. Hyg.* **31.** 549-570. 8 tables. [13 refs.]

Chlorine was proved to be the most practical and effective agent for killing cercariae in water. The chlorine in the form of gaseous chlorine, sodium hypochloride and chloramine were compared, and chloramine was found the most effective. All cercariae were killed in 30 minutes provided that 0·22 p.p.m. of available chlorine remained after ten minutes.—H. S. Purchase.

Sunkes, E. J., & Sellers, T. F. (1937). **Tapeworm Infestations in the Southern United States.**—*Amer. J. publ. Hlth.* **27.** 893-898. 1 table. [13 refs.]

Of 7,249 positive diagnoses of tapeworm in human faecal examinations, 98·6% were of the dwarf tapeworm (*Hymenolepsis nana*), which requires no intermediate host. Only 100 cases of other types were found, this being attributed partly to rigid meat inspection, and partly to thorough cooking and proper refrigeration.—E. E. Jelbart.

Horsfall, Margery W. (1938). **Meal Beetles as Intermediate Hosts of Poultry Tapeworms.**—*Poult. Sci.* **17.** 8-11. 1 table. [2 refs.] [See also *V. B.* **8.** 297].

Numbers of meal beetles of the species *Trilobium castaneum* and *Tr. confusum* were experimentally fed gravid segments of *Hymenolepis carioca*, *Choanotaemia infundibulum* and *Raillietina cesticillus*. The beetles were divided into two groups, each containing both species; one group had access to the segments only and the other to mash at the same time. Beetles from both groups were fed to laboratory-reared chickens under three months old. Dissection of beetles and P.M. examination of the chickens showed the highest infestation with *R.c.*, and the youngest birds were the most heavily infested. Examination of control birds in contact with infested chickens was negative. The result of the group feeding of the beetles proves that they will eat animal matter even though cereal products are available. Sources of infection, and the economic importance of the beetles are discussed.

Maplestone, P. A., & Bhaduri, N. V. (1937). *Taenia solium* **and** *Cysticercus cellulosae* **in India.**—*Indian J. med. Res.* **25.** 155-161. [Numerous refs.]

A summary of the available information in the literature on the subject of *T.s.* and *C.c.* in the indigenous population and in British soldiers in India, and a discussion thereon. A hereditary relative immunity in the natives is suggested as a possible explanation of the lower incidence of *C.c.* in those natives who eat pork.
—E. E. Jelbart.

Tarassov, V. (1937). De l'immunité envers le bothriocéphale *Diphyllobothrium latum* (L.) [**Immunity against** *Diphyllobothrium latum*].—*Ann. Parasit. hum. comp.* **15.** 524-528. 1 table. [9 refs.]

In 1931, 60 people were freed of *D.l.* in a population of 143 which had 86·7% of its number infected. Three years later only 20 of the previously freed group were found to have become re-infected.

T. then swallowed seven parasites from the pike. He became ill, and on treatment seven whole parasites were expelled. A year later only two of six parasites swallowed developed successfully. In the second and third year no parasite swallowed succeeded in establishing itself. In the fourth year, however, four out of six worms did develop. It is therefore shown that in T's case immunity did last two, although not three years.—H. S. Purchase.

WARD, H. B. (1935). **The Longevity of Diphyllobothrium latum.**—*Inst. exp. Med., Moscow. Coll. Works Commem. 25th Aniv. Prof. Pavlovskii, 1909-1934.* pp. 288-294. [18 refs.] [In English : Russian summary].

A maximum life-span of 21 years has been assigned to *D.l.* by various writers. W. considers that this opinion is based on insufficient evidence, and that cases in man thought to be of long standing are usually re-infections caused by eating infected fish.

BENNETT, W. (1937). **Gaps in our Present Knowledge of the Biology of the Hydatid Parasite.**—*N.Z. med. J.* **36.** 398-399. [Included in *Proc. Path. Bact. Soc. N.Z.*]

B. describes the work in New Zealand at the Medical School, Dunedin. Apparatus for scoleciculture was demonstrated. Scolices were found viable in offal kept at atmosphere temperature for at least two weeks. In cysts the numbers of scolices were estimated by serial dilution and in one case 800,000 were found in 132 c.c. of fluid.

Control of hydatids is necessary because of loss to the farmer as well as loss in human life. The suggestion was made, therefore, that all dog-owners should be given tablets of arecoline hydrobromide when dogs were registered, so that four doses a year might be administered. This form of control is probably being arranged with local bodies.—C. S. M. HOPKIRK.

LEVINE, P. P. (1937). **Observations on the Biology and Control of the Poultry Cestode Davainea Proglottina (Dav.).**—*Thesis, Cornell.* pp. 58. 30 tables. [Numerous refs.] [Thesis not published. Abst. prepared from author's MS.]

A method for the experimental infection of slugs with cysticercoids of *D.p.* is described, as well as a method for counting the tapeworms in the intestine of the chicken. Cysticercoid-bearing slugs surviving the winter may transmit *D.p.* to susceptible chickens in the following spring. Infected slugs after exposure to 3° to 5°C. for eight days, harboured viable cysticercoids of *D.p.* Exposure of infected slugs to −1°C. for 24 hours destroyed the slugs and the cysticercoids. The peak of segment discharge in the faeces of birds parasitized with *D.p.* occurs between 3.0 p.m. and 9.0 a.m. the following day. Few segments are discharged during the rest of the day. The total number of segments eliminated per day is fairly constant over a period of time, provided that the bird has become acclimatized to the feed, surroundings, etc. Segment production is dependent on the presence of digestible food in the intestine ; it is decreased when rations with low nutritive value are fed to the birds. The largest number of segments eliminated during any 24-hour period did not exceed the number of tapeworms in the intestines of the bird held under the conditions described in the paper. Tobacco dust in the feed in the proportion of 2% by weight did not prevent infection, nor did copper sulphate in the drinking water in the proportion of 1 : 500. The following drugs proved to be ineffective for removing *D.p.* from the intestines of parasitized chickens :– kamala, an iodine vermicide, thymol-nicotine tablets, kamala-nicotine tablets, thymol, carbon tetrachloride, tetrachlorethylene, turpentine, areca nut, areca nut with kamala, arecoline hydrobromide, Jen-Sal Fowl Powder Rx 2000, pelletierine tannate, beta-naphthol, rotenone, hexyl-resorcinol, oil of chenopodium, santonin, and oleoresin aspidium. The repeated shearing off of strobilae did not hinder the subsequent regrowth of *D. proglottina*.—HERBERT L. GILMAN.

Ackert, J. E. (1935). **Factors in the Resistance of Chickens to the Nematode Ascaridia lineata (Schneider).**—*Trud. Dinam. Razvit.* **10.** 413-422. [Numerous refs.] [In English : Russian summary].

A report on experiments carried out at different times to determine the factors influencing resistance of growing chickens to *A.l.* Resistance was estimated from the number and length of worms discovered P.M. ; it was found to be lowered by loss of blood and by lack of vitamins A, B and C. Vitamin D did not appear to affect resistance, but it protected chickens from the severe effects of parasitism. Higher resistance was observed in chickens whose diet was supplemented with meat and skim milk than in those given only a plant diet. Since resistance naturally increases with age, it was found difficult to determine whether or not it was also increased by a previous infestation. Some breeds seemed more resistant than others, and a notably resistant strain was found within a breed. General condition seemed to be an important factor.

Chitwood, B. G. (1938). **Notes on the Physiology of** *Ascaris lumbricoides*.—*Proc. helminth. Soc. Wash.* **5.** 18-19.

Fluid obtained from the excretory pore of ascarids taken from pigs only gave the dixanthyl reaction for urea within 24 hours of removal from the host. It is therefore probable that urea was obtained from the host and was not a true excretion of the ascarids.

Judging from some *in vitro* tests on protein suspensions with dissected oesophagi of ascarids, it appears that the oesophagus of *A.l.* secretes a proteolytic enzyme.—J. E.

Otto, G. F., Kerr, K. B., & Landsberg, J. W. (1937). **The Immunity to the Hookworm,** *Ancylostoma caninum*, **Acquired by Dogs as a Result of Previous Infection.**—*J. Parasit.* **23.** 560.

Dogs given 25-30 doses of *A.c.*, in increasing numbers of from 15 larvae up to 120,000 over a period of 4-5 months showed no ill-effects after test infections of 120-200 thousand larvae three weeks later. Those killed three weeks after the last test infection were found to harbour an average of 160 hookworms, while those killed after five weeks harboured less than half that number. Of two unimmunized dogs given the same infective dose, one died on the ninth day and the other became anaemic and was killed on the 35th day ; both were heavily infested. The essential in this form of immunization is to give slowly increasing doses over a long period of time.

Srivastava, H. D. (1937). **Verminous Pneumonia in Domestic Animals—Its Control and Treatment.**—*Agric. Live-Stk India.* **7.** 585-595. [12 refs.]

A popular article for farmers explaining existing knowledge of the parasites and their life-histories and details of prophylactic and curative treatment.—E. E. J.

Foster, A. O. (1937). **The Occurrence of** *Trichostrongylus axei* **(Cobbold) in Equines of Panama.**—*J. Parasit.* **23.** 573-574.

The first record of *Tr.a.* from Central America. F. reports four cases of infestation among seven horses examined P.M. The horses had been used as round-up mounts on a cattle ranch, and this fact suggests direct association with cattle as a probable source of infestation for equines, so that *Tr.a.* may even be a common parasite of the latter. The economic importance of the parasite for equines is discussed, and pasture rotation is recommended as a control method.

Meyer. (1937). Palisadenwürmer bei Absatzfohlen. [**Strongylosis in Foals**].—*Dtsch. tierärztl. Wschr.* **45.** 20-22.

M. describes an unusual form of strongylosis that occurred in three- to four-month-old foals in a stud. The affected foals showed a loss of condition and unsteadiness on their feet, with a mortality of 25%. The disease was prevented by the following treatment :– the mares were given an arsenic anthelmintic three weeks before foaling, and after foaling the mare and foal were taken into a disinfected box and the mare's faeces were always removed without delay. Foals were treated for worms when 12-14 weeks old with an arsenic preparation mixed with oats and were again treated when ten months and 18 months old.

—F. Freudenberg (Hamburg).

Whitney, L. F. (1938). **Longevity of the Whipworm.**—*Vet. Med.* **33.** 69-70.

Dogs known to be infested with whipworms during the summer showed no infestation the following spring, as indicated by results of faecal examination. No treatment had been given, but all precautions had been taken to prevent completion of the life cycle from the egg stage. It is concluded that the cold weather prevented incubation of ova, and that the adult worms died of old age, *i.e.*, at five months or less.

Andrews, J. S. (1937). **Acquired Resistance in Sheep to Superinfection with a Nematode, *Cooperia curticei*.**—*J. Parasit.* **23.** 559.

A. gives details of the reaction to infective *C.c.* larvae in uninfected lambs and in those previously infected with the nematode.

In uninfected lambs the larvae passed through the third ecdysis in the crypts of the intestinal mucosa on the fourth day, and there the subsequent increase in size often destroyed the epithelial wall and caused inflammation. On the fifth day the larvae, early in their fourth stage, returned to the lumen. In previously infected lambs, however, the intense inflammatory reaction produced by the administration of larvae led to the encapsulation of the larvae and their ultimate death, the centre of the affected area becoming an amorphous necrotic mass.

Glaser, R. W., & Stoll, N. R. (1938). **Development under Sterile Conditions of the Sheep Stomach Worm Haemonchus contortus (Nematoda).**—*Science.* **87.** 259-260. [1 ref.]

Haemonchus larvae at the end of their free-living stage were obtained from sheep faeces and isolated in a Baermann funnel, then washed by sedimentation in long glass tubes and caused to unsheath in Labarraque's fluid, the bacterial contamination thereby being lost together with the sheaths. The larvae were then transferred to a culture medium composed of 0·5% agar in Ringer's solution containing sheep liver extract, heat-killed ground yeast, sheep blood and kidney, the pH being 3·0. On incubation at 39·5°C. the larvae developed as far as the ecdysis of the third larval stage, which was infective for sheep.—J. E.

Kauzal, G. P. (1937). **A Preliminary Study of the Pathogenic Effect of Nematodirus spp. in Sheep.**—*Aust. vet. J.* **13.** 120-123. [3 refs.]

No pathogenic effects were produced by infestations with as many as 6,300 and 3,500 worms. In natural infestations as many as 32 thousand worms have been recorded. It is evident therefore that the artificial infestations were not sufficiently heavy to determine the pathogenicity of this parasite. Observations showed that eggs may appear in faeces as early as 29 days after administration of larvae. Maximum egg production was reached in 30-69 days. The very poor

egg-laying capacity of *Nematodirus* spp. was confirmed. In one case three thousand female worms gave faecal egg counts which did not exceed one thousand eggs per gramme.—H. McL. Gordon.

Wehr, E. E. (1937). **Studies on the Development of the Pigeon Capillarid, *Capillaria columbae*.**—*J. Parasit.* **23.** 573.

The development of the embryo is outlined. Air drying and sunlight are lethal to eggs, which can, however, exist at temperatures below freezing point. Symptoms and P.M. findings in infested pigeons are described.

Wehr, E. E. (1937). **A Note on the Incidence of *Syngamus Trachea* in Turkeys, with Observations on Nodules Caused by this Parasite.**—*Poult. Sci.* **16.** 331-334. 1 table. [3 refs.]

Examination of nearly a thousand turkey tracheas from the Washington district in the winter of 1936, for the presence of *S.t.*, showed an incidence of 14·7%. The male worm was usually attached to a nodule, in which the head was firmly embedded, often so as to render complete removal impossible. It is thought that the male may remain permanently attached, acting as an anchor for the female. The results of a histopathological study of the nodules are given.

Moorthy, V. N., & Sweet, W. C. (1936). **A Note on the Experimental Infection of Dogs with Dracontiasis.**—*Indian med. Gaz.* **71.** 437-442. 8 figs., 1 table. [4 refs.]

A dog was fed cyclops containing fully developed guinea-worm larvae, and also released larvae, obtained from human cases of dracontiasis. Adult worms and embryos recovered from the living animal nearly a year later were found to be identical with the human type of *Dracunculus medinensis*, although the number of embryos produced was smaller than in human cases. P.M. examination of 24 other artificially infected dogs revealed the worms in four cases; two types, one long and one short, were found, though both were of similar structure. It is suggested that the longer type may be the immature female *Dr.m.* and the shorter the more mature male.

Buckley, J. J. C. (1937). **On a New Species of *Stephanofilaria* Causing Lesions in the Legs of Cattle in the Malay Peninsula.**—*J. Helminth.* **15.** 233-242. 8 text figs., 4 figs. on 2 plates, 1 table. [6 refs.]

A species of *Stephanofilaria* (*Steph. kaeli*) was obtained at Kuala Lumpur, Federated Malay States, from cattle affected in the lower part of the leg. The lesions resembled those previously described in connexion with *Stephanofilaria*, but differed in their location. [This is the same condition as " Cascado ". See *V. B.* **4.** 663, and **5.** 33 and 280]. The disease is known locally as filarial sore or Krian sore, and is economically important on account of its high incidence and detrimental effects. The sore occurs on any part of the lower half of the limbs, and may vary from a simple lesion about an inch in diameter to one about eight inches long. The smaller sores are usually bleeding, irritable and somewhat denuded of hair. Larger sores are prominent and dry, crusty and almost hairless, with bleeding cracks and indentations. The sore tissue is vascular and bleeds freely when a portion is cut away. The worms were obtained by teasing out this tissue.

A description of female, male, and larval forms follows, and a comparison is made with species previously described. The possibility that the parasite is *Steph. dedoesi*, in view of similarity in dimensions and the geographical distribution,

is not overlooked, but D. considers that *Steph. kaeli* must be regarded as a new species on account of certain morphological differences, or until the range of variability of these characters is more accurately known.

Control measures are discussed, but little is known of the value of anthelmintics in killing helminth tissue parasites. Local freezing with ethyl chloride or carbon dioxide snow or local injection of anthelmintics are suggested. There is no doubt that an insect is concerned in the larval development and transmission, but incrimination of the vector requires further knowledge of the life-cycle of the worm and a survey of the incidence of the disease and the cattle-biting insect fauna.—S. J. Gilbert.

IMMUNITY.

Mohr, W. (1935). Zur Serodiagnostik der Brucellosis. [**The Serodiagnosis of Brucellosis**].—*Z. ImmunForsch.* **86.** 235-247. 5 tables. [11 refs.]

Non-specific agglutination of *Brucella abortus* by human sera can be explained by assuming that rough or otherwise unsuitable strains were used as antigen. A number of sera from normal persons, from pregnant women and from cases of tuberculosis and other diseases were examined, using four different strains of *Br.a.* isolated from human beings. These strains varied from completely smooth to completely rough. Numerous sera were positive against the rough and partly rough antigens, but negative against the smooth. Serum from pregnant women often agglutinated the rough strains.

No connexion was found between the agglutination of rough antigen and the sedimentation rate of the red blood corpuscles.—G. Slavin.

Pigoury, L. (1938). La réaction au formol dans la leishmaniose générale du chien. [**Formol-Reaction in Canine Leishmaniasis**].—*Cah. Méd. vét.* **8.** 1-5. 1 table. [9 refs.]

The test consists of the addition of five drops of formalin to 1 c.c. of blood drawn from a dog which has been previously starved. Opacity and gelation take place within half an hour with blood from affected animals. Control tests should also be made. This reaction does not take place with the blood of animals in the early stages, *i.e.*, in the first 3-6 months of infection.—H. S. Purchase.

Nakamura, J. (1936). **Complement-Fixation Reaction in Rinderpest. II. On the Thermolability of the Antiserum. III. Antigenic Properties of Diseased and Normal Lymphatic Glands.**—*J. Jap. Soc. vet. Sci.* **15.** 143-158 and 190-200 of pt. 1. 10 tables. [14 refs.] [In Japanese: abst. from English summaries. pp. 25-27 and pp. 35-5 of pt. 2].

II. The first publication [(1931). *J. Jap. Soc. vet. Sci.* **10.** 367. In Japanese: German summary] described a specific c.-f. reaction occurring between boiled extract of calf lymph node infected with rinderpest and anti-rinderpest serum. Inactivation at 55°C. for 30 minutes prevents this reaction, which however takes place if unheated normal cattle serum is added to the mixture. Sera of sheep, goats, horses and rabbits have the same effect, but not sera of g. pigs, swine, geese, and fowls. The thermolabile component is precipitated by CO_2, but ammonium sulphate precipitates the thermolabile and most of the thermostable component in the euglobulin fraction. Separation can also be effected by dialysis of the globulin fraction into water soluble and insoluble parts.

III. Antigenic properties of normal and rinderpest-infected lymph nodes of

cattle were studied, using sera prepared from cattle and rabbits and testing with raw and boiled extracts. Sera of cattle and rabbits hyperimmunized with normal lymph nodes both reacted with raw extract of normal and infected glands. Antigenic reaction is destroyed by boiling the extracts at 100°C. The serum of a rabbit hyperimmunized with rinderpest lymph node did not react to boiled extract of this material, contrary to the case in cattle. It is suggested that the reaction between raw extract and homologous bovine serum is a complex of two reactions. —S. J. Gilbert.

Cordy, D. R. (1938). **A Study of the Intradermal Allergic Test for Brucellosis in Guinea Pigs.**—*Thesis, Cornell.* pp. 41. [Numerous refs.] [Thesis not published. Abst. prepared from author's MS.]

A heat-killed suspension of brucella in physiological saline solution, a brucella broth culture filtrate, and a solution of brucella nucleo-protein in physiological saline solution in a dilution of 1 : 500, were used in 336 intradermal initial tests and retests of 56 brucella infected g. pigs and 32 uninfected controls. All the artificially infected animals reacted, while none of the controls gave definitely positive reactions. The broth culture filtrate showed 45% doubtful reactions among infected, and 20% doubtful reactions among control animals. The nucleoprotein gave 19% doubtful reactions among infected animals, and 4% among controls. The latter test agent gave equal results in densities of one billion and two billion organisms per c.c. Initial tests were successful 9-15 days after infection, and retests were successful 17 days after a prior test. The skin test showed very close agreement with the agglutination test, regardless of the virulence of the strain of brucella used for producing infection in the guinea pigs. Injection of dead brucella organisms did not produce skin sensitivity, nor did repeated skin testing sensitize uninfected animals. Tuberculin, *Escherichia coli* grown in broth and killed, and physiological saline solution rarely produced dubious reactions when inoculated intradermally.—Herbert L. Gilman.

I. Kenda, I. (1936). Komparativno ispitivanje maleina. [**Tests with Different Samples of Mallein**].—*Jugoslov. vet. Glasn.* **16.** 573-576. 2 figs., 1 table. [11 refs.] [German summary].

II. Hupbauer, A., & Lugomer, V. (1937). Nekoja opažanja kod potkožno maleiniziranih zdravih konja. [**Reactions of Healthy Horses to Subcutaneous Mallein**].—*Vet. Arhiv.* **7.** 61-70. 1 chart. [10 refs.] [German summary].

I. K. carried out comparative tests on glandered horses with samples of mallein obtained from four different institutes in four different countries. Two samples gave good results and two were found to be too weak. One of the former, the mallein prepared at the State Serological Institute, Križevci, Yugoslavia, will alone be permitted for use henceforth in Yugoslavia.

II. Forty-five healthy horses were given abnormally large doses (5 c.c.) of mallein (subcut.) All developed local reactions and six showed general reactions similar to those of glandered horses, whilst nine gave suspicious reactions. Complement-fixing antibodies developed in the horses 5-20 days after injection.

The authors consider that the conjunctival test is preferable to the subcutaneous one.—B. Oswald (Križevci).

I. Shwartzman, G., Morell, S., & Sobotka, H. (1937). **Chemical Investigations on the Active Principles of the Phenomenon of Local Skin Reactivity to Bacterial Filtrates. I. Purification by Dialysis, and Attempts at Frac-**

tional Precipitation.—*J. exp. Med.* **65.** 323-337. 3 tables, 1 chart. [Numerous refs.]

II. Shwartzman, G., & Morell, S. A. (1938). **Chemical Investigations on the Active Principles of the Phenomenon of Local Skin Reactivity to Bacterial Filtrates. II. Physicochemical Properties.**—*Ibid.* **67.** 1-12. 4 tables. [16 refs.]

III. Morell, S. A., & Shwartzman, G. (1938). **Chemical Investigations on the Active Principles of the Phenomenon of Local Skin Reactivity to Bacterial Filtrates. III. Application of Dialysis to the Production of the Active Principles in Fluid Media.**—*Ibid.* 13-23. 2 tables, 1 chart. [4 refs.]

I. Describes a method by which the active principles of this phenomenon can be separated and purified by dialysis. Cellophane membranes retained the active principles of culture filtrates of *Bacterium coli*, *Salmonella typhi* and meningococcus yielding on an average a threefold increase in their reacting potency. Attempts to purify culture filtrates by various methods of fractional precipitation were unsuccessful.

As the quantitative retention of the active principles by cellophane membranes suggested substances of a high molecular weight, a further study of these physicochemical studies was made.

II. By ultrafiltration experiments the filtration end-point appeared between membranes of 100-120 seconds representing a particle size of 50-100 $m\mu$. When fractionally precipitated with ammonium sulphate it was found that the fraction obtained at two-thirds saturation was particularly active. Studies of the isoelectric properties by means of capillary analysis and cataphoresis showed the iso-electric point to be between pH 3·0 and 4·0.

III. Describes a method of cultivating the same organisms in a diffused broth medium prepared by immersing cellophane bags containing saline in nutrient broth. Abundant growths were obtained in the diffusate media in the cellophane bags and when the culture filtrates from the diffusate media were dialysed they were shown to contain all the active principles and only extremely small amounts of non-specific ingredients.—Gwilym O. Davies.

I. Ramon, G., Lemetayer, E., Richou, R., & Nicol, L. (1937). La toxicité et l'activité immunisante des toxines injectées à l'animal d'expériences en mélange avec des substances diverses. [**Toxicity and Immunizing Power for Experimental Animals of Toxins mixed with Various Substances**].—*Rev. Immunol.* **3.** 285-318. 22 tables. [Numerous refs.]

II. Ramon, G., Richou, R., & Staub, A. (1937). L'immunisation au moyen de microbes vivants – bacille diphtérique, staphylocoque, bactéridie charbonneuse – additionnés de substances adjuvantes. [**Immunization with Living Bacteria Mixed with Various Substances**].—*Ibid.* 389-404. 3 tables. [Numerous refs.]

I. Experimental animals will resist relatively large doses of toxins, such as tetanus, diphtheria, and abrine toxins, if these are mixed with certain other substances, such as lanoline, prior to inoculation. It would appear that the toxin is not destroyed *in vitro*, but becomes gradually less virulent at the focus of inoculation. Although the toxin does not gain access to the circulation, the specific antitoxin does appear in the blood, and an immunity results from such injections equivalent to that produced by anatoxin under similar conditions. Olive oil, liquid paraffin, and alum behave in a similar way possibly to a less marked degree. With snake venoms the inhibitory action of these substances is only very slight.

II. The use of lanoline as an excipient for inocula of living diphtheria bacilli

or of staphylococci in rabbits and horses results in immunity and relatively large antitoxin production in the blood. The strain of diphtheria organism used must be one capable of producing a well marked local reaction under normal conditions. Dead staphylococci in lanoline were ineffective.

With the anthrax organism it is found that an attenuated strain such as Pasteur's first vaccine, when inoculated with lanoline, alum, or agar, will produce an early, solid and durable immunity to test inoculation.—NORMAN HOLE.

PONOMAREW, A. W., & PEROTTI, W. A. (1935). Die aktive Immunität des Zentralnervensystems gegen Tetanus. [**Active Immunity of the Central Nervous System against Tetanus**].—*Z. ImmunForsch.* **86.** 65-75. 3 tables. [6 refs.]

Dogs and rabbits inoculated (subcut. or intraven.) with tetanus anatoxin have no immunity against subarachnoid inoculation of toxin. No antitoxin is found in the cerebro-spinal fluid. Subarachnoid inoculation of anatoxin produces a strong local and general immunity, the general immunity being much stronger than that produced by the same dose of antigen inoculated subcutaneously or intravenously. Also, the antitoxin content of the blood rises more rapidly following subarachnoid inoculation. The antitoxin is of local origin.—G. SLAVIN.

DISEASES, GENERAL.

I. KOSSMAG. (1937). Konstitution und Krankheit. [**Constitution and Disease**].—*Tierärztl. Mitt.* **18.** 143-148.

II. KAMMEL, O. (1937). Erbfehlerforschung. [**Research on Hereditary Defects in Domestic Animals**].—*Ibid.* 743-747. [Also appeared in *Dtsch. tierärztl. Wschr.* **45.** 676-678].

III. KOCH, W. (1937). Konstitutionskrankheiten. [**"Constitutional" Diseases**].—*Dtsch. tierärztl. Wschr.* **45.** 781-783.

IV. SCHÄPER, W. (1937). Beitrag zur Vererbung des Kryptorchismus beim Pferd. [**The Inheritance of Cryptorchidism in Horses**].—*Tierärztl. Rdsch.* **43.** 816-817.

I. K. lays down as ideals that, in order to play his part in the successful execution of the German Four Year Plan, the veterinarian should make every endeavour to eradicate hereditary and constitutional diseases.

Examples of diseases in which constitution is an important predisposing factor are spavin, ringbone, bursitis and tendo-vaginitis, infertility, hoof defects, and roaring.

The opinions of a large number of German workers on the nature and importance of constitution are mentioned, and the conclusion reached is that constitution in man and animals is composed of two factors :– the inherited "anlage" (genotype) and the acquired environmental component (phanotype). The former is the more important, and knowledge concerning it can only be derived, both in man and animals, from the study of twins issued from a single ovum. Until such information is available, it is suggested that the advice given by SCHAEPER [*V. B.* **7.** 48.] is sound :– "a male is suitable for stud purposes if it has produced by mating with its own daughters 20 offspring, all of which are normal." This would probably be a sufficient test for the presence of recessive hereditary factors in a heterozygotic male.

II. This is a review of the most important hereditary defects known to exist in domestic animals ; it is intended for the breeder and veterinary practitioner, who is urged to report any such cases to the Central Department for Research ni

Hereditary Defects, Hanover Veterinary College. The following classification is adopted :–

A. Lethal hereditary factors usually resulting in death of the offspring :–

(i). In the foal :– atresia coli, often accompanied by cerebral glioma ; skin defects, *e.g.* congenital alopecia ; early death of obscure origin if repeatedly observed in foals of related mares.

(ii). In calves :– skin defects ; anchylosis and stiffness of joints ; death and mummification of the foetus ; muscle contractures ; animals born without legs or with only stump-like limbs.

(iii). In pigs :– atresia ani (very common and often cured by operation—therefore important to prevent such animals from breeding) ; paralysis, especially of hind limbs ; congenital blindness ; muscular contractures ; " thick legs " in piglets.

(iv). In lambs :– still birth ; muscular contractures with torticollis or inability to stand ; malformation of skeleton.

(v). In dogs and foxes :– complete or partial alopecia in litters.

(vi). In chicks :– non-viability (commonest in White Wyandottes) ; inability to stand, with posterior deflection of head ; death in the shell.

B. Defects which are not fatal and therefore more easily overlooked ; probably most important in genetics.

(i). In the horse :– nasal haemorrhage in thoroughbreds ; roaring ; rickets ; eye defects ; tooth defects.

(ii). In cattle :–loss of hair ; anomalies of udder and teats ; congenital and inherited eye defects, *e.g.* cataract and moon blindness ; monstrosities of all kinds ; predisposition to tuberculosis.

(iii). In pigs :– rhinitis (Schnüffelkrankheit) ; cryptorchidism (recently attained great importance owing to prevalence) ; hermaphroditism with abnormality of female genitalia ; skeletal defects.

(iv). In sheep and goats :– absence of ears and " mouse " ears ; cryptorchidism and hermaphroditism ; wool defects and alopecia ; absence of oestrus.

(v). In the dog :– defects of the hair ; epilepsy ; eye defects.

III. Two factors are concerned in the production of constitutional diseases—an inherited factor on the one hand and a variety of specific and non-specific environmental factors on the other. Such diseases occurring in domestic animals include :–

(i). In the horse :– soft horn, eczema of the extremities, rickets, spavin and bursitis and tendo-vaginitis.

(ii). In cattle :– tuberculosis, abortion, sterility and rickets.

(iii). In the pig :– disturbances of growth and development.

Constitutional diseases are undoubtedly increasing in Germany and are the result of intensive methods of soil cultivation and of the breeding of domestic animals for increased production beyond their physiological capabilities. The control of these diseases requires the careful selection of breeding animals with a view to producing young capable of remaining in health under modern conditions. The genetics of the future can only be carried out with the co-operation of veterinarians trained in the science of eugenics.

IV. This is a plea for the rigid exclusion from breeding of all cryptorchid horses. A striking example of the inheritance of cryptorchidism is given : during the course of 20 years a mare produced 13 foals ; of these ten were male and seven of them cryptorchids.

S. suggests early castration and notification of all cryptorchids and of normal stallions which have produced cryptorchid foals when mated with several mares.

—E. G. White.

Rivalier, E., Pham, H. C., & Decourt, P. (1937). Les infections de sortie. Essai d'interprétation pathogénique. [**Interpretation of Pathology of "Infections de Sortie"**].—*Rev. Immunol.* **3.** 219-241. 3 figs. [See also *Ann. Inst. Pasteur.* (1906). **20.** 801].

The experiments described in this article throw further light on the mechanism by which the "infections de sortie" are brought about. *Salmonella paratyphi* B inoculated into a mesenteric lymph node of a rabbit became generalized after some days with fatal results, and vaccination did not modify or prevent this effect. A feeble electric current applied to the left splanchnic nerve soon after inoculation prevented generalization, but if applied after 24 or 48 hours, generalization was precipitated. This reaction can be used to cause "infections de sortie" in the case of *S. typhi*, pneumococci, coli bacilli, staphylococci and cow pox. Spontaneous infection of the blood has also followed stimulus of the splanchnic nerve. The changes occurring in the lymph nodes were studied and the alterations illustrated. The effect of toxins and drugs or mechanical irritation applied to the sympathetic system in causing severe inflammation and infection is also considered.—S. J. G.

Anon. (1937). **Disease Control Work in Kwangsi Province, China.**—*Philipp. J. anim. Indust.* **4.** 483-485. 1 photograph on 1 plate.

Most of the veterinarians employed are from the Philippines. The quarantine law is easily enforced owing to the co-operation of all agriculturists. Rinderpest is more easily controlled in Kwangsi Province than in the Philippines, owing to the geographic conditions, which lessen risk of transmission, and to the now extensive use of vaccine, manufactured by the same process as in the Philippines. Outbreaks still occur in spring and summer. Permanent "carriers" are suspected, and the lowered vitality of the cattle after the winter, accounting for greater susceptibility in the spring, and the renewed activity, which facilitates transmission, may account for this seasonal incidence.

Hupbauer, A. (1937). Aktuelna pitanja kod zaraznih bolesti prasadi. [**Diseases of Sucking Pigs**].—*Jugoslov. vet. Glasn.* **17.** 226-234. 4 figs.

An account of the problems involved in swine breeding. Swine dysentery, swine paratyphoid, swine fever and swine influenza are briefly discussed, and recent methods for their prevention are described.—B. Oswald (Križevci).

Ciocca, O. (1937). Contributo alla conoscenza delle malattie degli animali da pelliccia. [**Diseases of Fur Animals**: *Fusiformis necrophorus* **and** *Corynebacterium pyogenes* **Infections in Nutria**].—*Nuovo Ercol.* **42.** 348-355. [6 refs.]

P.M. examinations of two nutria revealed necrotic lesions in the tail and subcutaneous connective tissues, but no lesions in the internal organs. *F.n.* was isolated from the lesions. Five nutria died as the result of infection with this organism.

In another nutria which died on the same farm there was enlargement of the lymph nodes, with pleurisy, pneumonic areas in the lungs and parenchymatous degeneration of the liver and kidneys. An organism morphologically and culturally resembling *C.p.* was isolated from the lungs.—J. A. Nicholson.

Goss, L. J. (1938). **A Survey of the Mortality in Farm Poultry Flocks with Special Reference to the Incidence of Tumors.**—*Thesis, Ithaca.* pp. 44. [Numerous refs.] [Thesis not published. Abst. prepared from author's MS.]

A report of the P.M. findings in a survey of over 24 thousand chickens from

six different flocks, covering 7,408 birds in which there were 8,604 disease conditions.

Tumours were present in 1,445 (19·51 %), and those composed of leucotic cells (of both the lymphocyte and myelocyte type) accounted for 13·38 %. 4·62 % of the tumours could not be microscopically examined because of decomposition. Most of them were undoubtedly of the leucotic type. Tumours other than leucotic-celled types were observed in 113 (1·53 %) of the birds. Thirteen different histological types of tumour were encountered. Most leucotic cell tumours (76·75 %) occurred in birds under twelve months of age. Adenocarcinomata and leiomyomata were found principally (91·66 %) in birds over one year of age. Incidence of the neoplasms was about equal in males and females.

Diseases of the egg organs were encountered in 16·97 % of the birds. Internal parasitism was present in 20·26 %. A chronic hepatitis (granuloma) of unknown aetiology was observed in 64 birds.—Herbert L. Gilman.

Lang, W. W. (1938). **Foal Mortality.**—*Vet. Rec.* **50.** 77-79. Addendum by Miller, W. C. pp. 79-81. Discussion pp. 81-83.

A general discussion of the clinical factors relating to foal mortality, from L's experience in Lincolnshire. Retained meconium and joint-ill are considered to be associated conditions. L. thinks the trouble may originate with the mare, and his treatment is to give to the mare prior to foaling 1-1½ lb. common salt highly diluted per stomach tube. The average annual mortality among foals for three years is stated to be 21·36 %.

The addendum consists of a consideration of the feeding of pregnant mares, with suggestions as to appropriate diet, emphasis being laid on an adequate supply of minerals and vitamins.—N. J. Scorgie.

Schustereit. (1937). Neuere Beobachtungen auf dem Gebiete der Fohlenlähme. [**Joint-Ill**].—*Dtsch. tierärztl. Wschr.* **45.** 393-398. [Numerous refs.]

S. discusses joint-ill and its aetiology. He suggests that hereditary disposition is of importance, and perhaps more important than intra-uterine or *post-partum* infection.—F. Freudenberg (Hamburg).

Šubat, N. (1936). Haemoglobinuria enzootica equorum cum paralysi pharyngis. (Zarazna hemoglobinurija konja s uzetošću ždrijela). [**Equine Enzootic Haemoglobinuria with Pharyngeal Paralysis**].—*Jugoslov. vet. Glasn.* **16.** 258-260. [18 refs.]

A concise description of an obscure disease of horses, a few cases of which recently occurred in Slovenia (Yugoslavia), and which is easily mistaken for the common paralytic haemoglobinuria [? myoglobinuria paralytica] of horses.

—B. Oswald (Križevci).

Wagner, H. (1937). Familiäres Auftreten des Einschusses bei Pferden. [**Familial Incidence of Lymphangitis in Horses**].—*Dtsch. tierärztl. Wschr.* **45.** 54-56.

W. noticed that 14 horses of a stud in Württemburg affected with lymphangitis belonged to four family groups (6, 4, 2 and 2 in each family respectively). In most cases they had horses from marshy districts (Niederungspferde) in their pedigrees. W. considers that cross-breeding, especially between these horses and the Württemburg native breed, engenders a tendency to lymphangitis (" Monday morning disease ").—F. Freudenberg (Hamburg).

Weischer. (1937). Beitrag zur Erforschung der Umweltfaktoren der Sommerwunden und der Sommerräude des Pferdes. [**Factors Affecting Summer Sores in Horses**].—*Berl. tierärztl. Wschr.* 21st May. 317-318.

From many years' experience of horses in mines in the Ruhr Valley, W. found that they were not affected by summer sores, and that sores disappeared in a week, without treatment, if affected animals were taken down the mine, because of the absence of " biting " flies. In W's opinion, fly " bites " are of the chief cause of the complaint. The movements of the horse in repelling the flies spread the sore and prevent it from healing. Only horses with inherited predisposition are affected, however. W. recommended the following control methods :– elimination from breeding of animals with inherited predisposition, leaving the tail its full length and control of flies.—F. Freudenberg (Hamburg).

Schäper, W. (1937). Entstehung und Bekämpfung der Mondblindheit im Lichte der Konstitutionsforschung. [**Nature of Periodic Ophthalmia**].—*Tierärztl. Rdsch.* **43.** 283-288. [Numerous refs.]

After comparing the existing views on the causes of periodic ophthalmia, whether hereditary or due to environmental influences, S. considers the disease from the point of view of allergy. He suggests that acute attacks of periodic ophthalmia are due to allergy produced by foreign protein related to helminth parasites (ascarids and strongylids) and that the allergy only appears in animals with an inherited predisposition.

Care of pastures, especially by drainage, and early adoption of worm treatment have proved successful as control measures. Where these measures are not possible, animals with an inherited predisposition for the disease must be eliminated from breeding.—F. Freudenberg (Hamburg).

I. Mizelle, J. D., & Graham, R. (1937). **Studies on So-Called Cornstalk Disease in Horses. V. Feeding Experiments.**—*Cornell Vet.* **27.** 374-380. 1 table. [12 refs.] [See also *V. B.* **7.** 317].

II. Schwarte, L. H. (1938). **Moldy Corn Poisoning in Horses.**—*J. Amer. vet. med. Ass.* **92.** 152-158. [2 refs.] [See also *V. B.* **7.** 623].

I. Cornstalk disease is commonly believed to be associated with the feeding of mouldy " corn " (maize), but there is no precise evidence as to the specific causative agent in the " corn ". The authors were unable to produce the recognized clinical symptoms of the disease by feeding experimental horses and mules on " corn " chaff, various fungi (*Aspergillus*, *Penicillium*, *Botryosporium*, *Actinomyces*, etc.) and a mixture of fungi and bacteria isolated from the brain of natural cases of the disease. Similar feeding experiments with rabbits, g. pigs and chickens gave negative results. The data obtained gave no clue as to the nature of the aetiological agent responsible for cornstalk disease.

II. This is a brief review of studies carried out by S. and his colleagues on a fatal nervous affection of horses which is associated with the feeding of mouldy " corn ". It is quite a distinct condition from specific virus encephalomyelitis, although there may be some difficulty in distinguishing the diseases clinically. The characteristic P.M. lesions in field and experimental cases were extensive brain lesions, namely, oedema, haemorrhage and liquefaction necrosis in the white matter ; the necrotic areas were yellowish-orange in colour, and of a creamy consistency. The disease has a seasonal incidence (November-May) which is distinct from specific virus encephalomyelitis (July-October). Suitable measures for prevention and treatment are recommended. The aetiological agent is still undetermined.—N. J. Scorgie.

Butozan, V. (1938). Hematurična goveda u jednogodišnjem promatranju. [**Chronic Haematuria in Yugoslavia**].—*Vet. Arhiv.* **8.** 158-169. [German summary].

Two affected cows and one ox were kept under observation for one year. Various drugs, such as alum, oak bark, and fol. uvae ursi, were administered *per os.* The animals were fed alternately on hay from regions where chronic haematuria in cattle was observed, and from unaffected regions. Blood cells could nearly always be detected in the urine, while chemical tests for blood were sometimes negative. Both the qualitative and quantitative blood picture varied considerably, and showed severe erythropenia. No parasites could be observed in blood smears. The animals weakened gradually and died from cachexia. Pathological changes were limited to the urinary bladder, and consisted of thickening of the mucous membrane, with petechiae and a tumour-like enlargement.—B. O. (Križevci).

Martin, A., Brizard, A., & Florio, R. (1937). De quelques modifications humorales dans certaines formes d'eczéma chez le chien. Déductions thérapeutiques. [**Humoral Changes in Eczema in the Dog**].—*Rev. Méd. vét., Toulouse.* **89.** 561-576. [12 refs.]

Eight cases of acute or chronic eczema in dogs showed a degree of hypochloraemia which the authors consider may have a direct bearing on these conditions. They suggest treatment with hypertonic saline injections, except in cases accompanied by nephritis or cardiac disorders.—A. Robertson.

Andersen, T. T. (1937). **The Etiology of Hepatitis Epidemica (Epidemic Jaundice).**—*Acta med. scand.* **93.** 209-227. 9 figs. [15 refs.] [In English].

The accepted belief is that human epidemic jaundice spreads by contact from one person to another, probably by droplet infection. Against this is the fact that in Denmark the disease occurs more frequently in rural than in urban districts. It is probable, therefore, that infection is not by contact, but by ingestion.

A common article of diet is partially cooked pork. Jaundice occurs in pigs, sometimes in epidemic form. It was transmitted to healthy pigs by feeding affected organs of pigs free from pathogenic bacteria. Duodenal fluid from a human case when fed to a pig caused changes in the liver typical of those seen both in the human and porcine cases. The infective agent is probably a virus. The greater incidence of the disease in rural districts may be explained by the less rigid meat inspection. and consequent increased opportunity of consuming infected material. [Meat inspection returns show that, in Great Britain, jaundice is rare in pigs slaughtered for food].—G. Slavin.

Stewart, D. F. (1937). **Neurolymphomatosis in Queensland.**—*Aust. vet. J.* **13.** 31-32. [2 refs.]

The presence of neurolymphomatosis [fowl paralysis] was recorded in Australia in New South Wales in 1933 and in South Australia in 1935. S. reports its occurrence in Queensland.—T. S. Gregory.

Schaaf, J. (1936). Die Leukose des Huhnes. [**Fowl Leucosis**].—*Z. InfektKr. Haustiere.* **49.** 214-245. 14 figs. on 4 plates, 1 graph. [Numerous refs.]

A detailed review of fowl leucosis with discussions on its epizoology, natural and artificial transmission, symptoms, blood picture, pathology and treatment. Fowl leucosis can be differentiated into two main conditions :- (1) non-transmissible lymphatic leucosis which is commonly aleucaemic and rarely leucaemic, and (2) transmissible erythrosis, a neoplastic disease of the erythropoietic system.

Lymphatic leucosis was observed in 6·7 % of all adult fowls which S. examined P.M. between December and March, and was common in pedigree poultry. The P.M. appearance, in contradistinction to the clinical and haematological nature, is very characteristic, and is represented by gross enlargement of the liver, spleen, and kidneys which have a speckled and granite-like appearance. Transmission tests with organ tissues and blood are always negative.

Erythrosis occurs in the common fowl and guinea-fowl, but not in any other species of birds or any small experimental animals. By skin inoculations it is easily transmitted to young chickens aged from one day to 12 weeks, and the incubation period varies from 5-320 days. The causal agent can be filtered through Berkefeld N and W candles and through membrane filters with a pore size of 6μ. It is not very resistant to external influences, but can resist desiccation. It is present in the blood and organs, but not in the excreta, and can be taken up from blood by ectoparasites such as *Dermanyssus avium* or *Argas reflexus*.

The blood picture in erythrosis is characterized by the appearance of degenerate and immature forms of erythrocytes and by leucopenia and thrombocytopenia. Attempts to treat erythrosis by numerous drugs have been unsuccessful, and it is stated that there is no connexion between erythrosis and Rous sarcoma or with infectious fowl paralysis, and that there is no immunity against erythroses.

—Sassenhoff (Munich).

I. Carstens, P., Wenzler, G., & Prüfer, J. (1936). Untersuchungen über die Verkrümmungen des Brustbeins beim Huhn. [**Curvature of the Sternum in the Fowl**].—*Arch. Geflügelk.* **10.** 97-129. 11 figs., 3 tables. [Numerous refs.] [English summary].

II. Ullrich, H. (1937). Ueber eine einseitige Verkümmerung der Brustmuskulatur eines Haushuhns als Folge einer Brustbeinverkrümmung. [**Unilateral Curvature of the Sternum and its Associated Muscles in a Cock**].—*Ibid.* **11.** 166-168. 2 figs. [1 ref.] [English summary].

III. Biegert, H. (1937). Untersuchungen über Brustbeinverkrümmungen bei weissen Leghorn und rebhuhnfarbigen Italienern. [**Curvature of the Sternum in Two Breeds of Fowls**].—*Ibid.* 209-248. 4 figs., 11 tables, 15 graphs. [Numerous refs.] [English summary].

I. 1,465 birds of Leghorn, Sussex and partridge-coloured Italian breeds were examined for the condition of their sternum. It was found that curvature of the sternum was commonest in birds produced from early hatching, and that the deformity was most intense at the period of most rapid growth, being first discernible at the age of 7-8 weeks. Curvature occurred earlier in Leghorn and Sussex fowls than in the Italian fowls, and cocks showed a greater degree of curvature than hens.

With regard to causation, the shape and arrangement of perches seemed to be significant, and it is also suggested that calcium and phosphorus utilization is implicated. No connexion could be found between curvature of the sternum and egg production, in-breeding, or constitutional factors. The progeny of hens with curvature was affected to a greater extent than that of normal hens.

II. In a fowl with severe curvature of the sternum to the right, the major and minor pectoral muscles were involved in the same way.

III. The incidence of curvature of the sternum in adult fowls was investigated at three poultry farms situated on different types of ground, subject to differences in climate. In general the findings of Carstens *et al.* [see I above] were verified, with the exception that no difference in incidence was noticed between cocks and hens, and no marked connexion was noted between the malformation and age. The Italian fowls were more severely affected than the Leghorns. In order to

find out whether the condition is nutritional in origin and related to rickets, B. investigated the calcium, phosphorus, vitamin D and protein contents of the food, but could find nothing of significance in this respect, nor was it possible to suggest that curvature of the sternum is an inherited defect or a sign of constitutional weakness.—Sassenhoff (Munich).

Pomeroy, B. S., & Fenstermacher, R. (1937). **Hemorrhagic Enteritis in Turkeys.**—*Poult. Sci.* **16.** 378-382. 4 figs. on 1 plate. [3 refs.]

This condition was met at P.M. examination in 35 cases during the months of June, July and August, 1936. The age of affected birds ranged from 7-12 weeks, and the mortality was approximately 10%. During the period in which losses were sustained, abnormally hot and dry weather prevailed, the birds were not provided with sufficient shelter and green food was scarce.

Bacteriological examination of organs in the majority of cases gave negative results, but *Bacterium coli commune* was isolated in a few instances, as also was a Gram-positive bacillus. *Bact. coli commune, Bact. coli communius* and a non-haemolytic staphylococcus were isolated from intestinal contents. The various organisms isolated were considered to be of secondary importance in the aetiology of the condition.—W. J. Ironside.

Slatineanu, A., Balteanu, I., Potop, I., & Franche, M. (1937). Sur la teneur en phosphore, en calcium et en potassium dans quelques maladies infectieuses. [**The Phosphorus, Calcium and Potassium Level in Infectious Diseases**].—*C. R. Soc. Biol. Paris.* **126.** 814-816. 1 table. [7 refs.]

In infectious diseases of human beings such as typhus, scarlatina, typhoid, etc., the authors found that the level of blood Ca and K was generally very low. Variations in acid-soluble and in mineral P in the blood bore no relationship to variations in the alkaline reserve.—N. J. Scorgie.

I. Bottorff, V. A., Tepper, A. E., Martin, C. L., Charles, T. B., & Reed, F. D. (1936). **Epidemic Tremors (Trembling Chick Disease).**—*Circ. N.H. agric. Exp. Sta.* No. 51. pp. 8. [2 refs.]

II. Devuyst, A. (1936). Contribution à l'étude biologique de rations determinant des symptômes de " leg-weakness " chez les poussins. [**Contribution to the Biological Study of Rations Causing Symptoms of " Leg-Weakness " in Chickens**].—*Bull. Inst. agron. Gembloux.* **5.** 50-73. 6 figs., 2 tables, 2 charts. [9 refs.] [English, German and Flemish summaries].

I. " Epidemic Tremors is a disease affecting the nervous system of poultry, resulting in a distinct and rapid tremor of the head, neck, and in some cases the tail ; in a majority of cases there is an ataxia. The mortality varies from practically nothing to 65%. . . . The first symptoms usually occur in two and a half to four weeks of age, showing a faint tremor or ataxia which grows worse as the chick gets older. Usually no new cases develop after the chicks are six to eight weeks of age."

Transmission experiments which included direct contact and intracranial inoculations of brain suspensions from affected chicks, gave no indication as to how this disease, which causes a permanent injury to the nervous system, was spread. The results of all breeding experiments indicated that it was not hereditary, nor was variation in incubation or hatching temperatures a contributory cause. The disease also occurred in chicks fed on all types of food, both commercial and New England College Conference formula, with varying protein levels. The affected birds showed no significant difference, in body temperature or blood counts and all attempts at treatment of the disease proved valueless.

II. Feeding experiments on 140 chickens (chiefly White Leghorns) divided

into five groups were carried out to determine whether the beneficial effects of a commercial foodstuff were due to its mineral and/or its vitamin content. It was concluded that the vitamin content of the product was the factor responsible for normal growth and health, but the experiments also showed that two distinct diseases, (a) enlarged hock, sometimes complicated with slipped tendon, and (b) nutritional paralysis, occur in chickens in addition to common rickets.—R. A.

CHAPMAN, M. P. (1938). **A-Avitaminosis in Chicks.**—*Vet. Med.* **33.** 173-175. [3 refs.]

C. describes the *ante-* and *post-mortem* findings in chicks fed a vitamin A-deficient diet. In general, his findings agree with those already described by other authors. The involvement of the bursa of Fabricus is one of the most characteristic lesions in chicks. The differential diagnosis from infectious roup, fowl diphtheria and laryngotracheitis is discussed.—N. J. SCORGIE.

PERLA, D., & MARMOSTON, Jessie. (1937). **Role of Vitamin C in Resistance.**—*Arch. Path.* **23.** 543-575 and 683-712. [Numerous refs.]

In an exhaustive critical review of the relevant literature it is concluded that most of the studies of the relationship between vitamin C-deficiency and increased susceptibility to disease throw but little light upon the subject. From amidst the mass of contradictory experimental data the following facts have been established :–

(1) Certain bacteria synthesize scorbutic acid [*i.e.*, a substance apparently identical with vitamin C], and chronic infection with an organism such as staphylococcus may for that reason delay the onset of symptoms of avitaminosis in a subject receiving a diet deficient in vitamin C.

(2) Deficiency of vitamin C, by lowering the resistance of the gums, tooth-pulp and mucous membranes, renders such areas less resistant to parasitic invasion. Demonstration of this is to be found in the well recognized fact that scurvy subjects are particularly susceptible to intercurrent infections.

(3) With regard to the influence of vitamin C-deficiency upon antibodies, the production of antibacterial antibodies is unaffected, but the opsonic action of the blood is lowered. Slight vitamin C-deficiency hastens the onset of anaphylactic shock and renders it more severe, whilst extreme deficiency impairs anaphylactic response. Antitoxin production appears to be poor in C-deficient subjects. The true significance of these apparently contradictory facts cannot at present be assessed.

(4) Excess of vitamin C appears to increase the resistance of animals to diphtheria toxin, tuberculin, anaphylaxis, trypanosome infections and that of monkeys to the virus of poliomyelitis, but the real therapeutic and prophylactic significance of this vitamin must be studied more. There is some experimental evidence to show that vitamin C plays an important role in tissue repair (*e.g.*, the healing of wounds) and it is suggested that the rapid tissue growth occurring during healing, as well as the increase of cell metabolism which occurs in febrile diseases, results in an increased rate of cellular oxidation for which a greater amount of vitamin C is needed, this vitamin acting as an oxidation-reduction system.—E. J. PULLINGER.

LEUTSKY, C. M. (1937). **Pellagra-Like Lesions Produced in Mice by Mineral Deficiencies.**—*Lancet.* **233.** 1421-1423. 2 figs., 2 tables. [Numerous refs.]

The production of pellagra-like lesions in mice fed on a basic diet of cereals is reported. Similar lesions were produced on a diet which was adequate in all respects, except that its mineral content resembled that of maize. The salt mixture

used was low in Na, Ca and Cl, and contained an excess of acid radicals. The symptoms in the mice disappeared after an adequate salt mixture (Osborne and Mendel's) was fed. It is suggested that the cause of pellagra may be an insufficiency in the mineral components of the ration [see *V. B.* **6.** 880].—N. J. Scorgie.

PUBLIC HEALTH.

Bendixen, H. C., Blink, G. J., Drummond, J. C., Leroy, A. M., & Wilson, G. S. (1937). **The Milk Problem. A Critical Study of its Nutritional, Hygienic, Economic and Social Aspects.**—*Quart. Bull. Hlth Org. L.o.N.* **6.** 371-504. 18 tables. [Numerous refs.]

This international report gives an account of the present position, and serves as a summary of existing knowledge. It ought, therefore, to be read in the original. The following points are of veterinary interest :–

Introduction.—Local authorities ought to safeguard milk supplies in the same way as they safeguard water supplies.

Nutritional Aspects.—By keeping high-yielding cows, overhead expenses are proportionally reduced, and more time is available for attention to details of hygiene. For general economic reasons dual-purpose cattle are recommended in preference to specialized dairy breeds. The influence of body character on milk yield and the inheritance of milk-yielding capacity are discussed, and explanations are given of the reasons for low butter fat content of milk from high milk-yielding cows.

The principles of feeding dairy cows are discussed in detail, emphasis being laid on the need for maintaining the calcium and phosphorus reserve in the body of the lactating cow. A study of the vitamin and mineral requirements of dairy cows is given, with special reference to supply of vitamins A, D, and C, and of calcium and phosphoric acid, and suitable mineral supplements are suggested ; the influence of different food-stuffs on the quantity, quality and nutritive value of milk and on its palatability is explained at length.

Hygienic Aspects.—A critical definition of " clean " and of " safe " milk is followed by a survey of clean milk production.

Diseases of dairy cows, the annual wastage from which in Great Britain is stated to be £3,000,000, are discussed with special reference to bovine tuberculosis, contagious abortion, and mastitis. Comparisons are drawn between the incidence of these diseases in Great Britain, Denmark, the Netherlands, Sweden, Norway and Switzerland, and the methods employed and progress made in the control and eradication of these diseases in the countries named.

Epidemics of disease among human consumers of milk are discussed and their salient features analysed ; pasteurization is dealt with in its many aspects and universal pasteurization of all milk supplies is emphatically recommended. It is pointed out that the eradication of bovine disease is an agricultural and veterinary problem rather than a public health one.

The report concludes with a survey of the economic and social aspects of milk production and distribution.—H. Burrow.

Lethem, W. A. (1938). **Slaughterhouse Practice at Home and Abroad : a Comparison between the Systems of Administration of Different Countries, the Methods of Meat Inspection and the Practice of Humane Killing.**—*J. R. sanit. Inst.* **58.** 562-572.

The lecturer dealt with the Public Health Acts and Imported Food Regulations,

compared meat inspection at home and abroad, and emphasized the necessity of *ante-mortem* inspection. He discussed the efficient utilization of by-products, and the Jewish method of slaughter and the improved methods of stunning by means of the captive bolt and electricity.

He pointed out that meat inspection in England is very unsatisfactory, and advocated the adoption of the Scottish method throughout Great Britain.

—T. Dunlop Young.

Jöhnk, M. (1937). Ueber die Frühgeneralisation der Tuberkulose beim Rind und den Verdachtsfall des Para. 23 Nr. 12 BB A. [**The Meat Inspection Aspect of Early Tuberculosis Generalization**].—*Berl. tierärztl. Wschr.* Nov. 5th. 681-687. 3 tables.

J. describes several cases of TB. in cattle imported from Ireland, in which the lesions appear to have differed from those usually seen in German cattle. The essential difference was the greater tendency to necrosis of the tubercle in Irish cattle and infection of the lymph nodes (prescapular, inguinal, and popliteal) without noticeable involvement of the internal organs. In German cattle the organs and serous membranes show signs of infection earlier than the regional lymph nodes. An important finding in six of the Irish cattle was the presence of caseous lesions (nodules) in the sub-cutis without other foci in the internal organs. These were regarded as tuberculous for meat inspection purposes, but cultures were not made. [It appears that these cases are identical with "skin lesions" of tuberculin test reactors reported from North America and elsewhere (*V. B.* **6.** 574 and **8.** 7 and 336)]. On account of J's findings the order of inspection in the Bremen abattoir has been changed, in that when any tuberculous focus is found the following lymph nodes must now be incised :– presternal, lower cervical, superficial and deep inguinals, precrural, iliac and sublumbar.—M. F. Benjamin.

THERAPEUTICS.

Lew, J. (1937). O vlivu rivanolu na mléčnou žlázu, stiženou stafylokokkovým a streptokokkovym zánětem. [**Treatment of Staphylococcal and Streptococcal Mastitis with Rivanol**].—*Zvěrolék. Rozpravy.* **11.** 157-161 and 169-191. 1 table. [Numerous refs.]

L. records the results of treating mastitis by the rivanol infusion method, doses of 700-800 c.c. of a 0·1% solution being used, and removed from the quarter after 30 minutes. Many cases were freed from infection, though not all resulted in a full recovery of secretory function.—E. Přibyl (Brno).

Cordier, G., & Menager, J. (1937). Essais de chimiothérapie dans les brucelloses bovines. [**Chemotherapy of Bovine Brucellosis**].—*Rev. Méd. vét., Toulouse.* **89.** 81-101 and 202-215. 12 tables. [3 refs.]

Numerous chemical agents were used in an attempt to prevent aborting cows from voiding *Brucella abortus* in their milk. G. pigs were inoculated with milk prior to and at varying stages after treatment of the cow. Many of the cows used received more than one treatment, up to as many as six different substances being inoculated into one animal. Among the agents used on the cows were gonacrine, "progone", animal charcoal, neo-stibosan, sulfarsenol, "C.B.K.", piroblue, yatren (Bayer), mercurochrome, naganol, phenol thionin, rivanol, camphor, argoflavin, "septacrol", "gametoxyl", endo- and exotoxins of *Br.a.*, and blood from a reactor cow. None of these substances produced any appreciable effect on

either the agglutination titre of the serum or the infectivity of the milk for g. pigs.

The second part of the paper describes the treatment of g. pigs already infected with *Br.a.* for two or three months and whose aggl. titre was at least 1 : 1000. For each substance tested, six or eight g. pigs were used, two of which were kept as controls. The presence or absence of brucella in the spleen after treatment was determined by cultural and biological methods. Argoflavin, " septacrol ", colloidal silver, urotropine, " progone ", " C.B.K.", neo-stibosan, anthiomaline, trypan red, rivanol, yatren-casein-Bayer, acaprin (Bayer), high titre bovine serum, killed cultures and culture filtrates had no effect on the disease. Some experiments were also performed on rabbits with the same result, but these animals proved themselves unsuitable for this type of work.—A. Wilson Taylor.

Puschmann, W. (1936). Einige Versuche über den Wert der Serobortanbehandlung bei der Bekämpfung des Bang'schen Abortus des Rindes nebst Beiträgen zur Frage der Epidemiologie der Banginfektion beim Pferde. **[Treatment of Bovine Brucellosis with " Serobortan ". Brucellosis in Horses].**—*Inaug. Diss., Hanover.* pp. 36. 10 tables. [18 refs.]

P. treated with " serobortan " (a proprietary substance produced from normal horse serum) 250 animals in nine herds which were heavily infected with contagious abortion. Serum agglutination tests and cultural and biological examinations of milk samples were made before the treatment began and again one year later. " Serobortan " was given *per os* two or three times a week for 1-2 months. No controls were kept. P. assumes that the agent stimulates the protective mechanism, leading to increased resistance and cessation of abortions. Infection with and excretion of *Brucella abortus* was not, however, prevented.

Out of 45 horses on these farms, 11 agglutinated *Br.a.* at 1 : 50 or higher. None of these showed clinical signs of infection.—A. W. Stableforth.

I. Dochez, A. R., & Slanetz, C. A. (1938). **The Treatment of Canine Distemper with a Chemotherapeutic Agent Sodium Sulfanilyl Sulfanilate.**—*Science.* **87.** 142-144. 1 table, 4 charts.

II. McIntyre, A. B., & Montgomerie, R. F. (1938). **Sodium Sulphanilyl Sulphanilate and Canine Distemper.**—*Vet. Rec.* **50.** 479-480. [Also appeared in *Brit. med. J.* April 16th. 875].

I. In a few controlled tests on ferrets inoculated with the virus of distemper, this drug effected a rapid cure whether given before or after the symptoms appeared, and 26 out of 28 naturally affected dogs recovered after a course of two daily doses of 1 g. [evidently *per os*]. Cats affected with cat distemper were also cured by it.

II. The authors report negative results followng administration of sulphanyl sulphanilate to dogs and ferrets affected with distemper. Sulphanilamide was also useless against the virus disease, but appeared to be of some value against secondary infections.—J. E.

Goussseff, W. F. (1936). Zur Frage der Behandlung der infektiösen Gelbsucht der Rinder. II. Mitteilung. **[Treatment of Bovine Infectious Jaundice. Part II].**—*Arch. wiss. prakt. Tierheilk.* **71.** 97-100. [1 ref.] [See also *V. B.* **6.** 585].

G. records further investigations into outbreaks of bovine jaundice on two infected premises. An attempt was made at prophylactic treatment by giving atoxyl (intraven.) or bismuth (intramusc.) to groups of calves, but such treatment

did not prevent infection. Between July and September 25% of the cattle on the affected premises developed the disease, and two died.

Of the animals treated symptomatically with sodium sulphate, caffeine, salol or urotropine, 9·8% died, but no deaths occurred in animals treated with atoxyl or novarsenol.

The histopathology was characterized by an exudative proliferative nephritis, atrophy of the cells of the central zone of the liver lobules, hyperaemia of the spleen, lungs and lymph nodes, and cloudy swelling of the heart muscle.—U. F. R.

I. Lesbouyries, & Berthelon. (1936). Pathogénie et traitement de l'endométrite chronique de la chienne et de la chatte. [**Pathogenesis and Treatment of Chronic Endometritis in the Female Dog and Cat**].—*Bull. Acad. vét. Fr.* **9.** 346-349. [1 ref.]

II. Lesbouyries, & Berthelon. (1937). Hormonothérapie sexuelle chez les carnivores domestiques. [**Sex Hormone Therapy in Dogs**].—*Ibid.* **10.** 126-132. [4 refs.]

III. Chelle, P. L. (1937). Les hormones sexuelles dans le traitement de la stérilité des femelles domestiques. [**Treatment of Female Sterility with Sex Hormones**].—*Rev. Méd. vét., Toulouse.* **89.** 5-18. [17 refs.]

I & II. A short review of existing knowledge of the sex hormones and a report of work on the use of folliculin in the treatment of endometritis of the bitch. Details are given of more recent studies of the action of folliculin and the gonadotropic hormone in the dog and cat. The authors find that the former may be employed with advantage where an increase in the intensity of oestrus is desired. The gonadotropic hormone is indicated in cases of sexual frigidity, ovarian insufficiency, in the treatment of chronic endometritis and, possibly, also in nymphomania.

III. Certain cases of sterility have their origin in ovarian insufficiency; in such cases the use of sex hormones is indicated. The article is mainly a summary of existing knowledge of these hormones and the development of hormonotherapy.
—C. Davenport.

Emmel, M. W. (1937). **Sulfur in the Control of External Parasites of Chickens. Preliminary Report.**—*J. Amer. vet. med. Ass.* **91.** 201-204. [1 ref.]

Birds fed on a mash containing 5% sulphur become freed from lice. It is claimed that the sulphur is excreted through the skin and, provided that the birds are exposed to sunlight, is converted into sulphur dioxide.—W. J. Ironside.

MacPherson, H. T., & Stewart, J. (1938). **Investigations on the Nature of Calcium Borogluconate.**—*Bio-chem. J.* **32.** 76-78. [3 refs.]

The "calcium borogluconate" of Dryerre and Greig [*V. B.* **5.** 522.], used in the treatment of acute hypocalcaemia and prepared by evaporating an aqueous solution containing five parts by weight of Ca gluconate and one part boric acid, is really a mixture of calcium mono- and di-borogluconates. Calcium borogluconate proper, for which a tentative formula is proposed, is formed from one molecule of calcium gluconate and two molecules of boric acid by loss of water (actually Ca diborogluconate) and in aqueous solution behaves as a mixture of these two compounds.—Alfred Eden.

I. Askew, H. O., & Dixon, J. K. (1937). **The Value of Cobalt Salts for Pasture Top-Dressing in the Treatment of Stock Ailment at Glenhope, Nelson, and**

Morton Mains, Southland.—*N.Z. J. Sci. Tech.* **19.** 317-325. 3 figs., 7 tables. [1 ref.]

II. Dixon, J. K. (1937). **The Value of Nickel Salts in the Treatment of Morton Mains Ailment.**—*Ibid.* 326-329. 1 fig., 3 tables. [3 refs.]

I. Cobalt nitrate added to pasture as a top-dressing at the rate of 2 lb. per acre at Glenhope in the Nelson district brought about a rapid rise in weight of sheep affected with "bush sickness". The pasture cobalt content rose from 0·05 to 0·2 p.p.m.

In Morton Mains a 10 lb. dressing per acre, while curing "bush sick" animals, raised the grass cobalt content six months later from 0·07 to 0·43 p.p.m.

II. Nickel incorporated with cobalt as a drench gives better results in curing "bush sickness" than does cobalt alone.—C. S. M. Hopkirk.

POISONS AND POISONING.

Daubney, C. G., & Nickolls, L. C. (1937). **An Investigation into the Methods of Toxicological Analysis of Viscera.**—*Analyst.* **62.** 851-859. 4 tables. [19 refs.]

The classical Otto-Stas method for the quantitative extraction of relatively small amounts of alkaloids from tissues is lengthy and tedious. The present investigations aim at increasing the accuracy, speed and ease of determination of alkaloids when approximately a M.L.D. has been absorbed. Sources of inaccuracy in the existing methods were examined and the following method was proposed. The tissue is frozen, then finely minced and weighed; warm water is added to disrupt the cells, the proteins are coagulated with ammonium sulphate and acetic acid, and the whole is filtered and washed. The residue is extracted with successive portions of acidulated water to extract quinine and with ammonium sulphate to extract morphine, and the alkaloids are extracted from the filtrate by appropriate solvents. Modifications of standard methods are described for the subsequent purification and estimation of the alkaloids morphine and quinine. —Alfred Eden.

Ward, J. C. (1936). **Thallium. XIII. Symptoms and Systemic Action on Cattle.**—*J. Amer. pharm. Ass.* **25.** 687-690. [13 refs.]

As a result of experiments carried out on four cows, W. found the M.L.D. of Tl for cattle to be about 25 mg. per kg. body weight. It is therefore unlikely that Tl-poisoned oats laid down to exterminate squirrels, etc., could cause deaths in cattle, as the concentration of Tl in one acre would not provide a lethal dose for even one cow. W. gives a detailed account of symptoms and P.M. changes.

Fraps, G. S., & Carlyle, E. C. (1936). **Locoine, the Poisonous Principle of Loco Weed,** *Astragalus Earlei.*—*Bull. Texas agric. Exp. Sta.* No. 537. pp. 18. 2 figs., 3 tables. [9 refs.]

Locoine, the toxic principle of *A.e.*, can be prepared from the plant by extraction with water or 95% alcohol. It is precipitated by phosphotungstic acid and from this the base can be recovered in a pure form by treatment with $Ba(OH)_2$. Tests with a large number of reagents for alkaloids are described. The chemical nature has not yet been determined, but it is a base containing about 8·8% N, soluble in water and alcohol, insoluble in ether, petroleum ether and chloroform,

and it forms an acetyl derivative. The tartrate, citrate, chloride and oxalate have been prepared, the two former salts being toxic to cats ; it is stable to boiling dilute acids and alkalis. The absence of Se and Ba from its composition has been confirmed.—ALFRED EDEN.

I. SACHWEH. (1937). Zentrale Läppchennekrose. [**Necrosis of the Central Lobules of the Liver Caused by Cod Liver Oil**].—*Dtsch. tierärztl. Wschr.* **45.** 130-132. 2 figs.

II. TIEDGE, F. L. (1937). Die Gefahren der Lebertranfütterung an Schweine. [**Dangers of Cod Liver Oil to Swine**].—*Ibid.* 132-133. [1 ref.]

III. NICOLAUS, W. (1937). Zur Frage der Entstehung der toxischen Leberdystrophie bei Schweinen infolge Lebertranfütterung. [**Toxic Liver Dystrophia in Swine Caused by Cod Liver Oil**].—*Tierärztl. Rdsch.* **43.** 386-392, 401-405 and 678-683. 3 figs., 6 tables.

I. Pure cod liver oil, even in large doses, does not produce liver lesions. Toxic effects may be produced when rancid oil is administered. The importance of the diet and of the calcium balance in controlling liver changes is emphasized.

II. Toxic changes were observed in the liver of pigs when they receive decomposed cod liver oil containing free fatty acids. Toxic effects were also produced with apparently normal cod liver oil.

III. An investigation on the importance of various factors in the aetiology of liver necrosis in pigs. The German white pig (Deutsche weisse Edelschwein) is especially susceptible, and in observations made 29·5% of such animals receiving cod liver oil showed liver necrosis. No necrosis was observed in pure land pigs (veredelte Landschweinen). Crosses between these breeds showed 7·4% of liver necrosis. This difference in susceptibility is independent of the diet and of the conditions under which the animals are kept. The age of the animals is an important factor, all cases having occurred in animals weighing from 17·5 to 35 kg. In all but three cases of poisoning, abnormalities were observed in the cod liver oil used. The occurrence of cases of liver necrosis amongst animals which had not received cod liver oil was also observed.

The production of liver necrosis is not associated with any special method of making emulsions of cod liver oil. The toxic effect of the emulsions tested was not dependant on any gross decomposition changes. Liver necrosis was observed in pigs receiving both unchanged and completely decomposed emulsions. Whether it will be possible to demonstrate by chemical methods toxic products in cod liver oil is a matter for further investigation.—J. M. ROBSON.

THORP, F., Jr. (1938). **Further Observations on Oat Hay Poisoning.**—*J. Amer. vet. med. Ass.* **92.** 159-170. 1 table. [7 refs.] [See also *V. B.* **7.** 641].

Serious losses among cattle after the feeding of oat hay, weedy barley hay and wheat straw are described. In all cases but two the hay was fed when damp due to snow. Symptoms observed in the cattle were suggestive of hydrocyanic acid poisoning, but in only two instances was this substance found in the hay, and then only a trace. Six cattle fed with hay from the same source all died, and the rumen contents of four gave a positive result for HCN by the sodium picrate paper method. As there was no evidence of HCN in the rumen of field cases the authors do not believe this substance to have been the cause of death. Sheep and horses were not affected by consumption of fodder which had proved lethal to cattle. Aqueous, alcoholic, and acid extracts of the oat hay were harmless when administered to laboratory animals.—N. J. SCORGIE.

Daley, C. J. (1937). **St. John's Wort Control. By Pasture Improvement and Grazing. Some Interesting Observations.**—*Agric. Gaz. N.S.W.* **48.** 301-305, 316 and 318. 4 figs., 2 tables.

A report on four years' trials which showed that on agricultural land heavily infested with St. John's wort (*Hypericum perforatum*) the raising of prime quality lambs can be successfully carried out under the following conditions :– sufficient improved pasture or fodder crop must be laid down to provide adequate rotational grazing to the wort ; Romney Marsh cross ewes, selected for dark muzzles, must be used as dams, and Suffolk rams as sires ; sheep must be hand shorn, with blade shears—*i.e.*, must not be machine shorn) ; sufficient shade trees must be available in grazing paddocks, and earmarking of lambs should be delayed until autumn.

This plant produces a dermatitis from photosensitization in animals with non-pigmented skins. Romney Marsh ewes were selected for darkness of features and because their extremities are well woolled. Southdown rams were tried, but the progeny were not sufficiently pigmented, and, consequently, suffered from dermatitis. Romney × Suffolk cross lambs were 95 % free from dermatitis.

—H. Mcl. Gordon.

Hindmarsh, W. L. (1937). **Mortality in Sheep Due to the Ingestion of the Foliage of Myall Trees (Acacia Pendula) Infested with the Boree Moth (Teara Contraria).**—*Aust. vet. J.* **13.** 124-125. [Also appeared in *Agric. Gaz. N.S.W.* **48.** 317-318].

Sheep were fed on the foliage of myall trees (*Acacia pendula*) which were heavily infested with boree or bag shelter moths. Of 300 sheep that fed on the infested foliage 20 died. P.M. examination showed severe gastro-enteritis. In the abomasum and small intestine were found a number of fibre balls, and these had produced injury to the mucosa and mechanical blockages. The hairs of the bag shelter moth caterpillars (*Ochrogaster contraria*) are known to be extremely irritant, and these hairs remain in the bags even after the caterpillars have left them. It is thought that the irritant hairs were largely responsible for the gastro-enteritis.—H. Mcl. Gordon.

PHYSIOLOGY.

Marston, A. T. (1938). **The Relation of the Deciduous and Permanent Molars in the Ox.**—*Proc. R. Soc. Med.* **31.** 495-496.

In support of the view that the so-called permanent molars do in fact belong to the second dentition, and are not deciduous teeth which erupt late, M. draws attention to the mandible of the ox. He suggests that the three-cusped second deciduous molar is the end tooth of the deciduous series, and that the three permanent molars, the first two with two cusps and the third with three cusps, are in serial homology with the other permanent teeth.—H. V. Hughes.

Batt, H. E. (1935). **The Normal Histology of the Endocrin Glands of Gallus domesticus.**—*Rep. Ont. Vet. Coll., 1934.* pp. 29-48. 19 figs.

The normal histology of the entire endocrine system of fowls is clearly presented in a well-arranged descriptive plan. Descriptions of the different cellular types and structural arrangements are aided by suitable illustrations, photomicrographs and drawings. Comparisons are made where marked differences occur in the histological structure of corresponding avian and mammalian glands. This

study, which does not lend itself to abstracting, is a much needed contribution to avian histology.—E. A. Watson.

Tehver, J. (1937). Uber den Ovulationstermin und die optimale Begattungszeit bei den Haustieren. [**Time of Ovulation and the Best Time for Mating in Domestic Animals**].—*Berl. tierärztl. Wschr.* July 2nd. 409-412. 5 tables. [Numerous refs.]

Owing to the short survival time of both released ova and spermatozoa, it is essential that animals be mated at the correct time. In all the domestic animals except the cat, ovulation takes place during the period of oestrus.

In the mare ovulation occurs at the end of oestrus, generally on the penultimate day, and the optimum time for mating is 48 hours before ovulation. As, however, this time cannot be accurately estimated it is necessary to have the mare served more than once during oestrus.

In cattle ovulation is believed to occur about 40 hours after the beginning of oestrus and the optimal time for mating is about 16 hours after it has started.

In sheep ovulation occurs 25-36 hours after the beginning of oestrus, the optimal time for mating being at the 22nd hour.

Little is known about this matter in swine and dogs, but in cats ovulation is said to occur only after copulation, as in rabbits.—F. Freudenberg (Hamburg).

I. Schour, I., Chandler, S. B., & Tweedy, W. R. (1937). **Changes in the Teeth Following Parathyroidectomy. I. The Effects of Different Periods of Survival, Fasting, and Repeated Pregnancies and Lactations on the Incisor of the Rat.**—*Amer. J. Path.* **13.** 945-970. 1 text fig., 20 figs. on 2 plates, 4 tables. [Numerous refs.]

II. Schour, I., Tweedy, W. R., Chandler, S. B., & Engel, M. B. (1937). **Changes in the Teeth Following Parathyroidectomy. II. The Effect of Parathyroid Extract and Calciferol on the Incisor of the Rat.**—*Ibid.* 971-984. 9 figs. on 1 plate, 3 tables. [11 refs.]

I. The authors studied the effect of parathyroidectomy in a series of 100 rats. Their findings showed that a correlation exists between the duration of the post-operative survival period and the histological changes in the incisor teeth. In one group of animals surviving from 3-20 days there was an increase in the density of the dentin. Survival beyond this period was associated with a progressive impoverishment in dentin calcification and a progressively accentuated alteration of over and under-calcification. The most severe histopathological alterations were found in a series of rats that were subjected to repeated pregnancies. Possible factors in the causation of the changes are discussed, and it is pointed out that the incisor teeth are valuable indicators in studying the physiology of the parathyroid glands in rats.

II. Treatment of parathyroidectomized rats with parathyroid extract or calciferol resulted in identical reactions on the dentin of the incisors, namely a short primary hypocalcified reaction and a secondary over-calcified reaction. The findings confirm that massive doses of calciferol do not necessitate the presence of the parathyroids in order to exert their effects.—N. J. Scorgie.

Parker, A. S. (1938). **Terminology of Sex Hormones.**—*Nature, Lond.* **141.** 36. [6 refs.]

It is suggested that the word gynaecogenic be used as a general term to describe activity which results in the production of the attributes of femaleness, and the word gynaecogen to describe a substance having such activity, since the power of

oestrogens to cause feminization of the plumage of birds can scarcely be called oestrogenic activity; the terms oestrogenic and oestrogen should be applied only to the production of oestrous changes. The capacity of many of the androgenic substances to cause growth of the uterus and mucification of the vagina would then indicate gynaecogenic activity, while transandrostenediol, which will cause actual cornification of the vagina, would also be oestrogenic.

There is a tendency to refer to hormones which have both androgenic and gynaecogenic properties as "bisexual", but the more correct form of the word is ambisexual, which could be applied with perfect propriety to substances, extracts, and organs which exhibit activities pertaining to both sexes.

Finally, reference is made to "gonadotropic" and "thyrotropic", etc. BURN has recently pointed out [see p. 620.] that the suffix "-tropic" as used to indicate hormones which stimulate the growth of particular organs is quite incorrect; he has suggested that "-trophic" would be much more suitable, and the term "gonadotrophic" has already been used by certain investigators.—R. A.

BROWNING, Ethel. (1937). **Manganese and Cobalt in Plant and Animal Economy.**—*Sci. Progr.* **32.** 276-289. [Numerous refs.]

Mn and Co are wide-spread in animal tissues and the author after noting their distribution, discusses their metabolism and possible functions. With regard to Mn, it is suggested that it acts as a catalyst in relation to the vital enzymic reactions of the organism, rather than as a specific stimulant of any tissue or group of tissues. Its action upon growth, reproduction and haemoglobin formation is due, it is thought, more to its general catalytic action than to any specific action.

Co is present in quantities which are so minute that the physiological necessity for its presence in tissues has been questioned. It is stated that its functions are possibly (a) a co-ferment [body capable of intensifying the action] of insulin, (b) a haemopoietic stimulant, and (c) a stimulant of the sympathetic system.—H. V. HUGHES.

TECHNIQUE.

FEDELI, A. (1937). Un nouveau milieu à la pomme de terre pour la préparation des vieilles tuberculines et de l' "exotuberculine". [**A New Potato Medium for Preparing Old Tuberculin and Exotuberculin**].—*Bull. Acad. vét. Fr.* **10.** 153-156. [4 refs.]

F. states that the allergic properties of exotuberculin prepared on potato medium according to the method of Zuwerkalow and Sarkissof [*V. B.* **7.** 126.] and of that prepared on Sauton's synthetic medium are practically identical. He also maintains that exotuberculin prepared by Sauton's method is superior to old tuberculin prepared on the special potato medium. Furthermore the method of preparing exotuberculin [*V. B.* **4.** 370.] is much simpler than that employed for old tuberculin.—GWILYM O. DAVIES.

RAINSFORD, S. G. (1937). **The Sterilization of T.A.B.C. Vaccine.**—*J. Hyg., Camb.* **37.** 539-551. 1 fig. on 1 plate, 13 tables. [6 refs.]

The observation by FELIX that suspensions of *Salmonella typhi* sterilized by heating at 58°C. for one and a half hours lose the Vi antigen, was confirmed. A proprietary method of sterilization called "Katadyne" was investigated and found to be effective in the sterilization of *S.t.* vaccines and without any destructive effect on the Vi, "O" or "H" agglutinogens. The method is applied either by

immersing Katadyne beads in the suspension, which is kept at 4°C. for several days, or by immersing in the suspension two silver electrodes connected with a dry battery, the virtue of the former merely lying in its convenience in use. Minute amounts of silver are released ; this silver is in the form of an unstable compound which ionizes freely, but the precise chemical nature of this compound is unknown.

Suspensions of " V " strains of *S.t.* sterilized in this way were found to be more effective immunogenic agents than those sterilized by heat and phenol. As they are hypersensitive to Vi antibody, but resistant to " O " antibody, it is suggested that they would be valuable for testing for the presence of Vi agglutinins in human sera. It is also suggested that this method might prove valuable in the preparation of other vaccines, especially those which hitherto have proved ineffectual in prophylaxis.—C. McGaughey.

MISCELLANEOUS.

Great Britain. (1937). **Livestock Industry Bill. [Including Amendments].** pp. iv+57+(9)+(3). London, Edinburgh, Manchester, Cardiff, Belfast : H.M. Stat. Off. [fcp] [1s. 3d.]

By this Bill a Live Stock Commission, consisting of a chairman and eight members, is constituted to keep under review the production, marketing and slaughtering of livestock and also the preparation of by-products, and to advise the government in matters affecting the livestock industry, the object of the bill being to assist farmers engaged in livestock raising for meat purposes, by the regulation of conditions and by the payment of a subsidy for fat beasts and carcasses.

Part V deals with the slaughtering, including abattoir schemes in three areas where such buildings are erected and operated. Private abattoirs will cease to operate and compensation will be paid to owners. Power will be given to any person authorized by the Commission to enter and inspect such public abattoirs, and local authorities may carry out the function of the Commission. Provision is made for the grading and marketing of carcasses, but not for veterinary inspection.

Included in other parts of the Bill are provisions concerning the marking of imported animals, bye laws of stock markets, slaughter schemes and research and education in relation to livestock industry.—T. Dunlop Young.

Blount, W. P. (1937). **Notes on the Operation of the Poultry (Exposure for Sale) Order, 1937, and Some Suggestions Concerning the Examination of Live Birds at Markets.**—*Vet. Rec.* **49.** 1373-1376.

B. suggests several amendments to the above Order, the most important being to require the removal of sick poultry to special isolation pens in or near the market pending a decision by the veterinary inspector as to whether the birds should be treated or destroyed. The veterinary inspector should have power to seize a bird for the purpose of a P.M. examination.

Diseases met with in poultry at markets are discussed, and the general symptoms to be noted are given. The importance of a careful examination of the comb, wattles, eyes and nostrils, for clinical symptoms of ill-health is stressed.

—J. E. Wilson.

—. (1937). Angående ett statens institut för folkhälsan. Underdånig skrivelse från Svenska veterinärläkareföreningens styrelse. **[Memorandum of the Swedish Veterinary Association about the State Public Health Institute].**—*Svensk VetTidskr.* **42.** 369-374.

A State Public Health Institute is being founded in Sweden. This memoran-

dum is a communication to the government from the Swedish Veterinary Association complaining that no veterinarian has been appointed to the board of the Institute and pointing out the importance of there being a veterinary member of the Food Hygiene Section.—Gustav Naerland (Oslo).

Kankaanpää, V., & Stenius, R. (1938). Eläinlääkintölainsäädäntö. [**Veterinary Legislation in Finland**]. pp. xiii+382. 12 figs., 3 tables. Helsingfors: Valtioneuvoston kirjapaino. [3rd Edit.] [8vo] [Fmk. 50].

The laws, orders, decrees, circulars and other publications concerning veterinary administration, veterinary surgeons, animal diseases, slaughter, meat and milk inspection, transport and protection of animals, etc., are collected in this book for the use of veterinarians.—R. Stenius (Helsingfors).

Bubberman, C. (1937). Een kwarteeuw van veterinairenarbeid in Nederlandsch Oost-Indië. [**25 Years' Veterinary Work in the Dutch East Indies**].—*Tijdschr. Diergeneesk.* **64.** 1206-1209.

The enactment of the " Ordinance on Veterinary State Control " (1913) and the founding of the Veterinary Bacteriological Institute and the Veterinary College (1908), both at Buitenzorg, strongly stimulated the efficiency of the State Veterinary Service as well as research and the teaching of veterinary science. Successful work on animal husbandry (importation of zebus from British India) is mentioned, as also the work done by veterinarians on improving meat and milk hygiene.

—. (1937). **Report of the Committee on Terminology.** [**Amer. Soc. of Parasitologists**].—*J. Parasit.* **23.** 325-329. [9 refs.]

The committee discussed the use of the words " infection " and " infestation ", and concluded that " infest " and " infestation " should revert to their original use in connexion with external, and in most cases visible agents, whilst " infection " should be used whenever the parasite invades the body of the host—including the alimentary tract. For conditions which do not lie clearly in either category, such as scabies and the invasion of ulcers by maggots, the terminology could be left to the judgement of the author.

The meaning of " symbiosis " was also discussed, and it was pointed out that this word was first used by de Bary in 1879, as a general term to include all degrees of parasitism, commensalism and mutualism. It is, however, commonly restricted to the relationship between organisms which live in mutually advantageous association. It is suggested that the term needs definition whenever it is used. Some disagreement also exists as to whether " symbiont " or " symbiote " is correct. The term " symbiont " was coined by de Bary, but " symbiote " is more correctly derived from the Greek. The terms may be used for either member of the symbiotic association.—U. F. Richardson.

OFFICIAL AND OTHER REPORTS.

Great Britain. (1937). **Annual Report of the Chief Medical Officer of the Ministry of Health for the Year 1936.** pp. 254. Numerous tables, 10 appendixes. [Numerous refs.] London: H.M. Stat. Off. [8vo] [4s.]

General Diseases.—The spread of Leptospirosis is due almost entirely to rats and other small rodents; the importance of reducing the rat population is therefore stressed. Psittacosis was diagnosed on several occasions in parakeets from Australia, Holland and Belgium. A brief account of recent research work

on the causation of CANCER is given. Statistics are given of information collected on UNDULANT FEVER.

MILK HYGIENE.—In connexion with the Milk (Special Designations) Orders, 1923 and 1936, the number of producers' licences for " Certified " and Grade A (T.T.) milk (under the 1923 order) in force on May 31st, 1936, was 928 in England and 176 in Wales. The Order of 1936 came into force on June 1st, and all licences after that date were issued by local authorities, the Ministry of Health retaining control until December 31st, 1936, of licences previously issued by that department. During the year the presence of tubercle bacilli was reported in supplies of designated milk from eight licensed tuberculin-tested herds. In England 34 herds licensed by the Ministry of Health under the Milk (Special Designations) Orders held Certificates of Attestation granted by the Ministry of Agriculture and Fisheries; the number of holders of " Tuberculin Tested " licences in Wales who have been granted Certificates of Attestation is also very small.

Enquiries into three extensive outbreaks of ENTERIC FEVER, ENTERITIS and SCARLET FEVER indicated that raw milk was the vehicle of infection in each case.

MEAT INSPECTION AND FOOD POISONING.—There is brief reference to the lack of uniformity in methods adopted by different local authorities to secure adequate meat inspection. The number of food poisoning outbreaks reported to the department was 82, as contrasted with 137 in 1935; 76 were investigated at the Ministry's laboratory. Salmonella organisms were isolated in 19 outbreaks and 26 were regarded as due to a " toxin " produced in the food as a result of bacterial growth; further research work is required on the identity of the " toxins ". There was evidence of salmonella infection due to duck eggs in five outbreaks, and in one case salmonella infection of milk was proved. 380 ml. of antirabic vaccine were issued by the Ministry's Laboratory.—J. C. WALLACE.

—. (1937). **The National Institute for Research in Dairying 1912-1937. Twenty-Fifth Anniversary Review by the Staff of the Institute.** pp. xxi+59. 3 tables, 5 photographs. Reading: Nat. Inst. Res. Dairying. [8vo].

This review gives a short history of the origin and development of the Institute, a brief account of its present relationship with the farm, the dairying industry generally and the public, and summarizes the dairy research work undertaken.

In a chapter on certain diseases of dairy cattle the incidence of tuberculosis and contagious abortion in the Institute herd are dealt with, and also the results of investigations on milk fever, the wastage of dairy cows and the viability of the tubercle bacillus. Other subjects considered include milk secretion, the chemical quality of milk and its control, milk taints, the nutritional value of milk, and pig husbandry.—J. C. WALLACE.

I. IRISH FREE STATE. (1937). **Report of Veterinary College of Ireland [1936-7].** —*Rep. Minister Agric. I.F.S., 1936-37.* pp. 37-43. 1 table.

II. IRISH FREE STATE. (1937). **Report of Veterinary Research Laboratory [1936-7].**—*Ibid.* pp. 73-74.

III. IRISH FREE STATE. (1937). **Report of Work under the Diseases of Animals (Ireland) Acts, 1894 to 1935 [1936-7].**—*Ibid.* pp. 113-117, also pp. [50] to [54].

I. There were 128 students in college during the year, 62 being new entrants. The results of the examinations of the Royal College of Veterinary Surgeons are shown in the table.

ROUTINE.—80,165 specimens examined in the laboratory during the year consisted of 76,207 for the agglutination test for *Salmonella pullorum* infection in

poultry, 704 for the aggl. test for contagious abortion in cattle and 3,254 morbid specimens for diagnosis; an analysis of the results showing the various conditions found is given.

Poultry Diseases.—An increase in the incidence of *S.p.* infection, Coccidiosis, Tuberculosis, and Blackhead in turkeys and fowl chicks is reported. Fowl Typhoid and Fowl Pox show a slight decrease in the number of cases recorded and the incidence of Leucaemia and Fowl Paralysis remains low. Worm infestation is a serious problem.

Diseases of Other Animals.—Worm infestation in young thoroughbred horses and Mastitis in cattle are referred to as conditions causing heavy losses to farmers.

II. The following specimens were received for examination :– Anthrax, 8; Blackleg, 3; Contagious Bovine Abortion, 631; Parasitic Mange, 9; Sheep Scab, 131; Swine Fever, 155; Tuberculosis, 2,678, and miscellaneous, 214. The Swine Fever and Anthrax material proved negative; 103 scrapings of wool contained Sheep Scab acari.

The following vaccines were issued :– anti-abortion 5,042 doses, Braxy 21,787 doses and Blackleg 9,261 doses.

Research work on vaccination against Contagious Abortion and TB. of swine was continued and preliminary investigations were commenced on Contagious Pneumonia of swine and Parasitic Gastro-Enteritis.

III. The list of diseases dealt with under the Diseases of Animals (Ireland) Acts, 1894-1935, remained unchanged.

Tuberculosis in cattle, Parasitic Mange in cattle and horses and Sheep Scab were the only scheduled diseases which occurred. 2,156 cattle were slaughtered under the Bovine Tuberculosis Order as compared with 2,630 in 1935-36. There were 227 outbreaks of Sheep Scab as against 287 in the previous year.

The new Warble Fly (Treatment of Cattle) Order is explained fully. Reference is made to odd deaths in cattle following the prescribed treatment.

The embargo on the importation of livestock from Great Britain was maintained. Two small consignments were admitted, one from Scotland subject to 14 days' isolation on the purchaser's premises, and one from England subject to three weeks' quarantine at the London Quarantine Station.

The appendixes give details of the outbreaks of scheduled diseases and the expenditure of local authorities on the administration, etc., of the Acts and Orders.

—J. C. Wallace.

Australia, Queensland. (1937). **Annual Report of the Department of Agriculture and Stock, for the Year 1935-1936.** pp. 251. Numerous tables, 2 graphs. Brisbane: David Whyte, Govt. Printer. [fcp].

This report covers the whole range of the Agricultural Department's activities and only certain portions can be referred to here. An important new departure during the year was the appointment of a science co-ordinating officer for the purpose of correlating the activities of various research organizations concerned in agricultural and livestock problems throughout the State and the extension and advisory services available to the agricultural industry. Such co-ordination should be extremely beneficial. It is intended to organize and correlate all such services, and in addition a division of animal industry has been organized in relation to the problems of disease and nutrition. As a part of the re-organization which is in progress, arrangements have been completed for the transfer of control of the Townsville Research Station from the Council of Scientific and Industrial Research to the Queensland Department of Agriculture and Stock. It is apparent from the

report of the Science Co-ordinating Officer that there is a very full appreciation of the great part played by problems of nutrition in animal industries and with that in mind the activities of research organizations in connexion with plant industry are to be concerned very largely with the problems related to pastures, since they constitute in Queensland, as in most other countries, the most important crop.

Considerable work was undertaken on TICK FEVER during the year, and numerous cattle were immunized simultaneously against *Babesia bigemina* and *Anaplasma marginale* by inoculation with blood obtained from cattle maintained as reservoirs of *B.b.* and *A. centrale*. The inoculation causes a reaction to the former in 7-14 days, followed by a reaction to the latter in 20-40 days. The piroplasm reaction may be severe, but can be controlled by drug treatment, whereas the anaplasm reaction is comparatively mild and it does not require special treatment. Immunity as a result of such dual inoculation proved effective against all forms of TICK FEVER in Queensland, including those due to *Babesiella argentinum* [*Babesia argentina*] and *A.m.* It is not practicable to inoculate against either of the latter organisms owing to the severe reactions they cause and inability to control *A.m.* infection by drug treatment. It was found highly desirable to use within 24 hours the blood drawn from reservoir animals, otherwise there was a risk of *B.b.* failing to survive, and, therefore, of the inoculated animals acquiring no immunity to this organism. It is anticipated that the use of this dual vaccine will increase very considerably the more its great advantages are realized by the pastoral industry.

100 ml. of 1% piroblue solution was successful in controlling the reaction to *B.b.* in cattle undergoing inoculation. Usually one treatment was sufficient to produce rapid recovery, though occasionally a second treatment 24 hours later was required. Queensland experience confirms that of other workers that piroblue is of no value in cases of *B.a.* infection or ANAPLASMOSIS ; to be most effective for the parasites against which it is active it must be given intravenously, and this constitutes a serious drawback when its use must be left in the hands of untrained persons under field conditions. Supplies of akiron and acaprin were obtained and used experimentally in doses of 5-10 ml. (subcut.). Against *B.b.* these drugs were as effective as piroblue, and they seem also to have definite value against *B.a.* The fact that they can be used subcutaneously is very much in their favour.

Buffalo fly has not spread appreciably from previously affected areas and precautions are being maintained. Outbreaks of CONTAGIOUS BOVINE PLEURO-PNEUMONIA totalled 35, a decrease of 15 from the previous year. The culture vaccine against this infection was used during the year in place of the " natural virus " derived from natural cases of the disease. Excellent results were obtained and this, coupled with its convenience and reliability, is expected to lead to its exclusive use in future. Vaccine against CONTAGIOUS MASTITIS of dairy cattle was supplied extensively during the year by the Department's laboratory at Yeerongpilly.

Seasonal conditions in general were favourable and prices of livestock were maintained or showed improvement. Owing mainly to drought conditions in the previous year the number of sheep in the state had declined by nearly three million to 17·8 million.

With regard to the Veterinary Medicines Act 1935/6, it was considered best to adhere meanwhile to the annual submission of statutory declarations on labels and samples for the purposes of registrations, rather than to extend the period. This is due to the frequency with which licensees under the Act desire to alter their formulae. Although alleged cures for CONTAGIOUS BOVINE ABORTION are prohibited from sale by this Act, it is said that farmers still ask for them and the demand is met from sources outside the state, thus stressing the need for uniform acts of this nature throughout Australia. The Veterinary Medicines Board has

decided that all nicotine sulphate used in the treatment of PARASITIC GASTRO-ENTERITIS must contain " 40% of nicotine by weight, free and/or combined, and shall be free from coal tar bases ". Some 600 materials were submitted to the Board for registration or renewal of registration during the year.—D. A. GILL.

BURMA. (1935). **Report on the Veterinary Department, for the Year ending 31st March 1935.** [MITCHELL, D. T.] pp. 26. 8 tables, 2 graphs, 3 maps, 1 appendix. [1 ref.] Rangoon: Supt. Govt. Printing and Stationery. [8vo] [Rs.2] [3s.]

STAFF.—Included three Europeans, four Asiatics with veterinary college degrees, and close on 200 assistants of various grades.

GENERAL DISEASES.—29,257 cases of non-contagious disease were treated by veterinary assistants during the year, and 2,157 cases were attended to at Isein Veterinary Hospital.

CONTAGIOUS DISEASES.—Ninety-three equines were inoculated with autogenous STRANGLES vaccine. ANTHRAX was reported from 26 districts with a total mortality of 1,009. 5,916 animals were inoculated with vaccine by the staff of the department, including 378 elephants. 2,629 elephants were also inoculated by the staffs of timber firms with very satisfactory results. There were 1,478 deaths from HAEMORRHAGIC SEPTICAEMIA, and 1,812 animals received preventive vaccination. One case of GLANDERS was reported. BLACKLEG caused 242 deaths. No cases of TETANUS, EPIZOOTIC LYMPHANGITIS or COCCIDIOSIS were reported. Eight districts were affected with SURRA, 62 deaths being recorded in equines and three in bovines. RINDERPEST was prevalent, with a mortality of 21,564. 72,533 animals were inoculated with serum. Twenty-three deaths were recorded from FOOT and MOUTH DISEASE, which was wide-spread. 18,158 cattle and buffaloes were inspected in quarantine.

EDUCATION.—A course for the education of veterinary assistants was held at Insein Veterinary College and a refresher course for veterinary inspectors. Students were also selected for training in Indian Colleges. Lectures were given in villages by Departmental officers.

RESEARCH.—At Insein Veterinary College 910 blood smears and 51 other pathological specimens were examined. 699 faecal examinations were made from elephants and 302 from dogs. 19,687 doses of various vaccines were issued. Research on immunization of elephants against ANTHRAX was undertaken, but mortality has already been much reduced by vaccination. Tests on elephants with anthelmintic drugs were carried out. Experiments were made on the longevity under field conditions of goat spleen vaccine for RINDERPEST, and the use of desiccated spleen pulp. Experiments on OSTEOPOROSIS indicate that the disease is not entirely due to dietetic deficiency. This disease is prevalent in Rangoon.

Other investigations were made on STRANGLES, " AVIAN DISTEMPER " [NEWCASTLE DISEASE], and a disease of dogs which can be transmitted by blood inoculation and which appears to bear a close resemblance to *Eperythrozoon ovis* infection in sheep.—S. J. GILBERT.

BURMA. (1936). **Report on the Veterinary Department, Burma, for the Year Ending the 31st March 1936.** [MITCHELL, D. T.] pp. 28. 8 tables, 2 graphs, 3 maps. Rangoon: Supt. Govt. Printing and Stationery. [8vo] [Rs.2] [3s.]

STAFF.—This was the same as in 1935.

GENERAL DISEASES.—23,968 cases of non-contagious disease were treated by field staff and 1,892 at the Veterinary Hospital, Insein.

Contagious Diseases.—Two deaths from Strangles were recorded. Anthrax was reported from 30 districts with a total mortality of 929. 10,540 bovines, 193 equines and 433 elephants were inoculated with spore vaccine. 2,716 elephants were inoculated by the staffs of timber firms. There was one death from Bovine Tuberculosis. 8,254 deaths from Haemorrhagic Septicaemia occurred; 8,679 bovines were inoculated with vaccine. Blackleg caused a mortality of 909, but outbreaks had usually subsided before the disease was reported. Surra caused 58 deaths in equines and 25 in bovines. Rinderpest was again prevalent, with a mortality of 28,509. The serum-alone method was discontinued during the year and vaccine with desiccated goat spleen substituted with successful results. Foot and Mouth Disease was again wide-spread, 113 deaths being recorded.

Education.—The course for appointments as Veterinary Assistants was again completed at the Insein Veterinary College and a three months' refresher course held. Ten students were selected for training at Indian Veterinary Colleges and lectures in villages were continued.

Research.—At the laboratory at Insein Veterinary College 878 blood smears and 110 other pathological specimens were examined, and 455 faecal examinations were made. 45,542 doses of various vaccines were issued. Immunization of elephants against Anthrax is proceeding satisfactorily and a study is being made in selecting and maintaining strains. Difficulty is experienced in obtaining elephants for experimental work. An outbreak of cat Septicaemia occurred in wild animals at the zoo. Preventive inoculation with a *Pasteurella* isolated from a leopard was carried out and considered to have given good results. An emulsion of goat spleen in glycerin-saline for Rinderpest vaccination proved unsatisfactory in Burma. Desiccated spleen pulp from reacting goats, prepared by drying rapidly over $CaCl_2$ *in vacuo*, is dispatched in small tubes packed in ice in a thermos jar, the ice being renewed every three or four days. On the day of inoculation, the powder is ground up with a definite quantity of normal saline and given in 1 c.c. doses. The optimum dose has not yet been ascertained, but observations indicate that a dosage of 0·001 g. produces a solid immunity.

Preliminary work has been performed on the investigation of Kumri. Dry Coat in horses appears to be increasing, but it was difficult to obtain affected animals for experimental work.—S. J. Gilbert.

Federated Malay States. (1937). **Annual Report of the Institute for Medical Research for the Year 1936.** [Lewthwaite, R.] pp. 157. Numerous tables. Kuala Lumpur: F.M.S. Govt. Press. [8vo] [$1] [2s. 4d.]

A list is given of a few specimens examined for the Veterinary Department; 50% of these, examined for *Salmonella pullorum* infection, were all negative. Three samples of milk and one of pleural exudate were examined for Tuberculosis; all were negative.

Forty brains of animals (35 from dogs) were examined for rabies; six dog brains were positive. 144 c.c. canine vaccine (20% sheep brain emulsion in 0·5% carbol saline) were issued to the Veterinary Department.—F. J. Andrews.

British Somaliland. (1938). **Annual Report of the British Somaliland Veterinary and Agricultural Department for 1937.** [Peck, E. F.] pp. 29. 2 tables. [fcp] [Mimeographed].

Somaliland Camel Corps.—Anthrax is now prevented by annual inoculation. Trypanosomiasis in camels is readily controlled by the use of Bennett's test and injections of naganol. Ponies are inoculated with Horse-Sickness vaccine obtained from Kenya and no cases occurred, although the animals were stationed in known

infected areas. HELMINTHIASIS of ponies is treated with oil of chenopodium and turpentine in mineral oil instead of linseed oil. An increase of unpurified sea salt to 5 oz. per day for camels was followed by great improvement in their condition.

PROTECTORATE VETERINARY WORK.—ANTHRAX is not usually reported by natives, but inoculations of government and private stock are advisable. BLACKLEG has increased and it is hoped to introduce a vaccine next year. Two cases of TUBERCULOSIS occurred in European-owned dogs, although the disease has not yet been observed in other animals; it is common amongst the native population. CONTAGIOUS BOVINE PLEURO-PNEUMONIA was slightly more prevalent. An extensive outbreak of RINDERPEST occurred and movement of stock was restricted. For various reasons double inoculation cannot be practised to any extent. Glycerinized vaccine is being obtained from the Sudan, for use in outbreaks as they arise. One case of RABIES occurred in a Somaliland bitch after arrival in England.

A dip was in operation with good results and the use of dip is increasing rapidly. 6,028 doses of naganol were sold during the year. A method of issuing naganol in solution was devised and proved satisfactory even after three months' storage. TICK PARALYSIS was observed in a few camels.—S. J. GILBERT.

[Note: corrigenda for abstract of previous report (*V. B.* **8.** 401.) :– (1) the word " regular " should be omitted before " dosing with copper sulphate ", and (2) for " boils " of camels read " contagious necrosis of the skin "].

COLONY OF MAURITIUS. (1937). **Report of Veterinary Division, 1936.** [LIONNET, F. E.]—*Rep. Dep. Agric. Mauritius, 1936.* pp. 35-37.

TUBERCULOSIS.—1,500 doses of BCG vaccine were received and used during the year. Of 75 bovines tested with tuberculin, three gave positive reactions, and were destroyed.

REDWATER.—Four cases were recorded.

TRYPANOSOMIASIS.—Nineteen thousand smears from bovines and 270 from equines were examined; 66 bovines and two equines were positive, 39 showing *Tryp. evansi*, 28 *Tryp. vivax* and one *Tryp. theileri*.—F. J. ANDREWS.

POLAND. (1937). XV Zjazd Lekarzy i Przyrodników Polskich we Lwowie. [**Polish Medical and Biological Congress in Lwów**].—*Przegl. wet.* **52.** 426-434.

The veterinary section discussed matters relating to diseases of animals, animal breeding and food hygiene. A number of resolutions were passed on the subject of founding a State Veterinary Council for the organization of veterinary services (including meat inspection) throughout the country and to enquire into the veterinary instructional course at the veterinary colleges. Methods of enlisting the support of farmers and animal breeders were also discussed.—A. S. (Lwów).

MADAGASCAR. (1937). Rapport Annuel de l'Institut Pasteur de Tananarive, Année 1936. [**Report of the Pasteur Institute, Tananarivo, for 1936**]. [GIRARD]. pp. 54. 3 tables, 1 graph. Tananarive: Imprimerie Officielle. [8vo].

The greater part of this report deals with research and vaccine production for medical services, and includes an account of the increased and successful use of live vaccine for human bubonic plague.

1,308 examinations were made by the veterinary section, including 803 milk examinations. Positive diagnosis of ANTHRAX was obtained on 11 occasions in cattle. The preparation of ANTHRAX vaccine is the chief work of this section and 1,820,000 doses were issued during 1936. This is a spore vaccine, stated to be prepared by the methods of Theiler and Velu. Experiments on the keeping

properties and virulence of vaccine showed that it remained active for 11 months in 1% saponin and for nine months in lanoline.

A survey of the incidence of BOVINE TUBERCULOSIS was made in certain districts. 3·62% of dairy cattle in the vicinity of Tananarivo were found infected, but in larger herds of zebus, which were less isolated, 45% infection has been observed. ANAPLASMOSIS and PIROPLASMOSIS were diagnosed in cattle.—S. J. G.

I. INDO-CHINA. (1937). Rapport sur le fonctionnement de l'Institut Pasteur de Nha-trang en 1936. [**Report of the Pasteur Institute, Nhatrang, Indo-China, for 1936**]. [JACOTOT, H.]—*Bull. écon. Indochine.* **40.** 315-327. [6 refs.] [Also appeared in *Arch. Inst. Pasteur Indo-Chine.* **7.** 121-123].

II. INDO-CHINA. (1937). Institut Pasteur de Saigon. [**Report of the Pasteur Institute at Saigon, Indo-China, for 1936**].—*Arch. Inst. Pasteur Indo-Chine.* **7.** 105-111.

III. INDO-CHINA. (1937). Institut Pasteur de Hanoi. [**Report of the Pasteur Institute at Hanoi, Indo-China, for 1936**].—*Ibid.* 113-118.

I. 459,625 doses of RINDERPEST vaccine and 60,050 doses of antiserum were prepared. 8,777 doses of 10 c.c. each of antirabies vaccine were issued. Vaccines and antisera for HAEMORRHAGIC SEPTICAEMIA and other diseases were made. Losses due to SWINE FEVER and PORCINE PASTEURELLOSIS have been much diminished by the use of the appropriate products.

II. The work of this Institute is chiefly of medical interest. 2,825 persons received antirabic treatment. Inoculation diagnosis of 141 brains of animals suspected of RABIES was performed, with positive results in 86 cases. 850 examinations were made by the veterinary section. Fifty-nine P.M. examinations of dogs suspected of RABIES were made. 6,325 doses of FOWL CHOLERA vaccine were issued. Diseases of pigs were studied and preventive measures investigated.

III. 1,540 persons received antirabic treatment. Inoculation diagnosis of brains of 136 dogs and 14 cats was performed, with positive results in 71 cases.

—S. J. GILBERT.

I. REPUBLIC OF PANAMA. (1935). **Annual Report of the Gorgas Memorial Laboratory, 1935.** [CLARK, H. C.] pp. 14. 1 table. [8vo].

II. REPUBLIC OF PANAMA. (1937). **Annual Report of the Gorgas Memorial Laboratory, 1936.** [CLARK, H. C.] pp. 18. 8 tables. Washington: U.S. Govt. Printing Office. [8vo].

I. From a veterinary point of view the chief work was done on the trypanosome disease of horses "Murrina" (*Trypanosoma hippicum*). It was shown that cattle are the chief reservoir of the trypanosome and that the vampire bat is an important vector of the disease. Bayer 205 in conjunction with tartar emetic gives satisfactory results in treatment. Carriers of the disease, if cattle, can be detected by a complement-fixation test.

Some work was done on *Strongylus vulgaris*, which is considered to cause more loss of efficiency in horses and mules than any other disease.

II. Work on trypanosomes, particularly *Tryp. cruzi*, was continued.

Verminous aneurysms of equines were the chief object of study in the helminthology department. A large number of autopsies revealed the arterial lesion in over 80% of cases, and it was found in animals of all ages. Work on the pathology of the lesions and on the biology of the numerous species of worms encountered is being continued.—F. J. ANDREWS.

BOOK REVIEWS.

MUNCH-PETERSEN, E. [M.Sc., B.A., F.D. McMaster Animal Health Laboratory, Division of Animal Health, University of Sydney, Australia]. (1938). **Bovine Mastitis. Survey of the Literature to the end of 1935.**—*Rev. Ser. Imp. Bur. anim. Hlth.* No. 1. pp. 272. 46 tables. [Numerous refs.] Weybridge: Imperial Bureau of Animal Health. [4to] [10s.]

This is a detailed review of the literature of the subject up to the end of 1935.

After a general introduction which discusses the incidence of mastitis and the losses due to it, there are chapters on "The Relation of Streptococcal Mastitis to Human Health" (pp. 27), "Causes of Mastitis" (pp. 24), "The Bacteriological Aspect of Streptococcal Mastitis" (pp. 57), "Organisms Other than Streptococci as Causes of Mastitis" (pp. 6), "Diagnosis of Mastitis" (pp. 62), "The Natural Course of Streptococcal Mastitis" (pp. 2), "Latent Mastitis" (pp. 2), and "Treatment and Prevention" (pp. 29). In a brief conclusion the author summarizes his conception of what must be done to find means for the control of this important disease.

The bibliography is very full, covering over 2,000 references. This review should be in the hands of all interested in bovine mastitis.

STANG, V. [Prof. Dr.] (1938). Ueber Konstitution und Erbfehler. Sowie deren Feststellung und Bewertung für die amtliche Körung. [**Constitution and Inherited Defects. Examinations for Soundness**]. pp. 86. 2 tables, 2 charts. [Numerous refs.] Berlin: Richard Schoetz. [8vo] [RM.2.60].

This is a guide to the inspection of male breeding animals for soundness, with special reference to animal breeding in Germany, under the Order on the Advancement of Animal Breeding of May 26th, 1936.

It deals generally and specially with genetics and its connexion with diseases in the horse, ox, sheep, goat and pig, and modern opinions on the heritability of specific diseases are given. Advice is given as to whether veterinary surgeons examining animals affected with such diseases should pass them or not: in this connexion it is interesting to note that the advice sometimes differs for young and for old animals affected with the same blemish, *e.g.* roaring and spavin.

This is a useful book on the subject, and includes the full text of all the German administrative orders and instructions, a list of relevant books and an index.—J. E.

SCHMIDT, H. [Prof. Dr. phil. nat.], & PETER, F. M. [Dr. med.] (1938). **Advances in the Therapeutics of Antimony.** pp. x + 257. 3 tables, 10 diagrams, 1 appendix. [Numerous refs.] Leipzig: Georg Thieme. [8vo] [RM.18].

This is the English edition of a book which was first published in German at the beginning of 1937 and which has already been reviewed [see *V. B.* **7.** 505]. The rapidly increasing literature is here given up to the end of 1937, and the book includes a number of unpublished results of experimental work in connexion with preparations of antimony. The book should be invaluable to anyone interested in the clinical applications and pharmacology of the antimony compounds, but has, unfortunately, no subject index.—J. M. ROBSON.

AMMON, R., [Dr. med. Habil., Dr. Phil., Dozent für Physiol. und Pathol. Chemie an der Universität Breslau], & DIRSCHERL, W., [Dr. Med. Habil., Dr. -ing. Habil., Dozent für Physiol. Chemie an der Universität Frankfurt A.M.] (1938). Fermente, Hormone, Vitamine und die Beziehungen dieser

Wirkstoffe zueinander. [**Ferments, Hormones and Vitamins**]. pp. xvi + 451. 71 figs., 41 tables. Leipzig: Georg Thieme. [4to] [RM.30].

This monograph provides an extensive survey of present knowledge on enzymes, hormones and vitamins, and since the original connotation of these terms has been considerably modified in recent years by increasing knowledge of dietary precursors, the authors aim at setting them in clear biological relationship to one another. For instance the body can, under suitable conditions, synthesize vitamin D from ergosterol in food, and the hormone thyroxin from iodine in food. We do not speak of iodine as a vitamin, but if it were an obscure organic compound instead of a well known inorganic element we might well have done so. Vitamin C is now identified as the chemical compound ascorbic acid, which must be applied as such in the diet of man and the g. pig, but which can be synthesized by rabbits, rats and most other animals and is therefore not a dietary essential for them. Under definitions prevalent a few years ago ascorbic acid would have to be classified as a vitamin for the g. pig but a hormone in the rat, and the authors therefore treat the word " vitamin " as a make-shift which should be replaced by a precise chemical term as soon as structure is ascertained. The term " hormone " is primarily retained in its classical sense to refer to specific substances elaborated by specific glands and carried by the blood stream to exercize specific functions in another part of the body, but the authors consider that no confusion is introduced if it is suitably qualified for more general use in words such as phytohormone, neurohormone and tissue-hormone.

The first 143 pages of the book deal with enzymes, including brief reference to their use in industry, in the laboratory and in the clinic. The next 169 pages are devoted to hormones, the last few pages dealing with their function in invertebrates. The ensuing 93 pages deal with vitamins, including the J, P, and H factors, and the vitamins of plant life or phytohormones, such as bios, auxin and heteroauxin. The last 36 pages are devoted to a discussion of the relationships and interactions between enzymes, hormones and vitamins.

A sufficiently comprehensive subject index is provided and the book is one which should find a place in all relevant reference libraries.—H. H. Green.

Burn, J. H. [Professor of Pharmacology at the College of the Pharmaceutical Society, London University]. (1937). **Biological Standardization.** pp. xviii + 288. 64 figs., 71 tables, 3 appendixes. [Numerous refs.] London: Humphrey Milford, Oxford University Press. [8vo] [21s.]

Out of the 28 international standards which are kept at the State Institute, Copenhagen, or at the National Institute for Medical Research, London, and listed in Appendix I to this book, 18 have been introduced since 1930. No more eloquent commentary on the increasing use and importance of biological standardization can be made, and this book thus appears at a very opportune time.

In the first three chapters the general question of standardization is considered, and the use of a constant and permanent standard by which variation in groups of animals can largely be eliminated is stressed. The methods by which tests of activity can be performed are discussed, and the mathematical treatment of the results is then described. In the ensuing chapters the author describes the methods used in standardizing various substances. The various hormones are first dealt with, followed by the vitamins. Chapters on the cardiac glucosides, ergot and ergometrine, organic arsenic and antimony compounds, and antimalarial substances, complete the description of the methods of biological standardization.

The book is exceptionally clear and the apparent simplicity of the subject is further enhanced by touches of the author's dry humour. Wherever necessary full practical details are given. The subject matter is fully up to date and well illustrated, and every chapter ends with a list of the important references.—J. M. Robson.